ISO 6431, VDMA 24562 AIR CYLINDERS

GENERAL SPECIFICATIONS

SPECIFICATIONS	CYLINDER BORE					
Piston Dia.(mm)	32	40	50	63	80	100
Cushion Stroke (mm) Each End	19	19	23	23	29	30
Operating Pressure Range	0.5 bar to 10 bar					
Operating Temperature Range Standard Seals High Temperature Seals	-30°C to +80°C -20°C to +200°C					
Operating Fluid	Filtered Compressed Air/Lubricated or Non-Lubricated					
Standard Stroke Lengths	1mm to 1000mm					
Maximum Stroke Length	2000mm					
Stroke Tolerance	+1.0mm/-0mm					
Piston Speed	5mm/s to 1000mm/s					
Life Expectancy	3000km					

HOW TO ORDER

The Model Number for all Bimba ISO 6431 Cylinders consists of four Alpha-Numeric clusters. The first cluster designates the *Type*, the second the *Bore Size*, the third the *Stroke Length*, and the fourth the *Options*.

A variety of *Mounting Kits* are available for use with each basic cylinder. Please select the required mounting type from the specifications shown in the appropriate Bore Size Section. The basic cylinder can be ordered by referring to the chart below, and the following example:

Model Number **A-32-100-CBFB**: This is an ISO 6431 Type Cylinder, with 32mm Bore Size, 100mm Stroke Size, and with Cushions in Both Heads and Flow Controls in Both Heads.

A-32-100-CBFB

TYPE	BORE SIZE	STROKE	OPTIONS
A	32mm 40mm 50mm 63mm 80mm 100mm	ENTER STROKE IN mm	CB = CUSHIONS BOTH HEADS CF = CUSHION FRONT HEAD ONLY CR = CUSHION REAR HEAD ONLY D = DOUBLE ENDED FB = FLOW CONTROLS BOTH HEADS FF = FLOW CONTROL FRONT HEAD ONLY FR = FLOW CONTROL REAR HEAD ONLY J = NITRILE ROD SEAL (NBR) HR = HIGH TEMPERATURE SEALS (-20°C to +200°C) M = MAGNETIC PISTON NT = NO ROD THREADS EE = EXTRA ROD EXTENSION

CONVERSION TABLES

	METRIC UNIT OF MEASURE	METRIC TO IMPERIAL CONVERSION	IMPERIAL UNIT OF MEASURE	IMPERIAL TO METRIC CONVERSION
FORCE	Newton (N)	x 0.2248	Pound (Lb)	x 4.448
PRESSURE	Bar (b)	x 14.5	Pounds Per Square Inch (PSI)	x 0.069
MEASUREMENT	Millimetre	x 0.03937	Inch	x 25.4
TEMPERATURE	Centigrade	$\frac{9x\ C}{5}\ 32$	Fahrenheit	$\frac{5x\ F\ 32}{9}$

CYLINDER OUTPUT FORCES

The cylinder output force is based upon the following formula:

Extending Stroke

$$F = P\frac{\pi D^2 10}{4}$$

Retracting Stroke

$$F = P(\frac{\pi D^2 10}{4} - \frac{\pi d^2 10}{4})$$

F = Cylinder Force (N)
D = Piston Diameter (cm)
P = Operating Pressure (bar)
d = Piston Rod Diameter (cm)

HOW TO USE THE FORCE CHART

EXAMPLE:

Q. What is the Force (N) developed by a 40mm Bore Cylinder at 5.5 bar on the extending stroke?

A. Using the 40mm bore chart draw a vertical line up from the point at 5.5 bar on the pressure axis until it intersects the Cylinder Extend Line. Draw a horizontal line to the left until it intersects the Force Axis. The point at which the line intersects the Force Axis is the Output Force (approximately 690 N).

The chart for each Cylinder Bore has a simplified formula which can also be used to determine the output force.

EXAMPLE:

40mm Bore Cylinder at 5.5 bar

F = 125.6 x P (bar) F = 691 N

NOTE:

The actual output force will be less than calculated and should be reduced to account for frictional forces.

ROD BUCKLING FORCES

The rod buckling charts are based upon the following formula:

$$BL = \frac{\pi^2 EJ}{(l \times M)^2 S}$$

BL = Permissible buckling load (N)
E = Modulus of elasticity (N/mm^2)
J = Moment of inertia (mm^4)
l = Buckling length = Stroke (mm)
M = Stroke Multiplier
S = Safety factor (minimum 5)

HOW TO USE THE ROD BUCKLING CHART

EXAMPLE:

Q. What is the maximum stroke for a 40mm Bore Cylinder on the extending stroke with a Type 'C' mounting and operating at 5.5 bar?

A. Using the 40mm bore chart draw a vertical line up from the point at 5.5 bar on the pressure axis of the cylinder force chart until it intersects the Cylinder Extend Line. Draw a horizontal line from the intersecting point of the lines to the right until it intersects the line for the type 'C' mounting on the Rod Buckling Chart. Then draw a vertical line down until it intersects the Maximum Cylinder Stroke Axis on the Rod Buckling Chart. The result is a maximum stroke of approximately 680mm.

The Charts can also be used to determine the maximum operating pressure and cylinder needed based upon the stroke needed and the mounting type by reversing the above procedure.

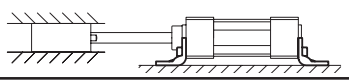
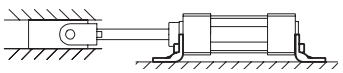
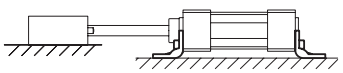
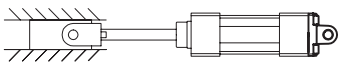
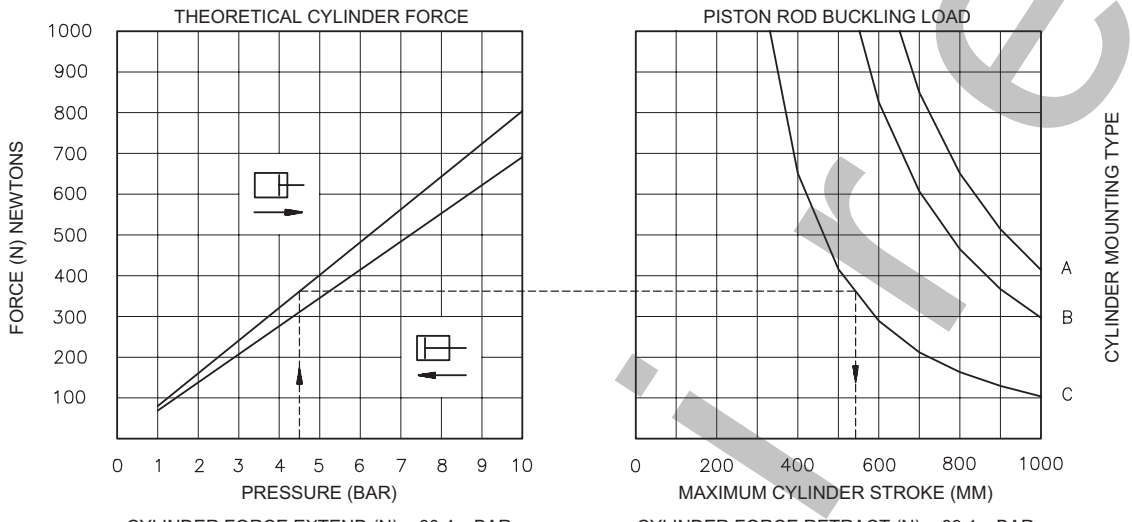
ROD END CONNECTION	CYLINDER MOUNTING	TYPE	STROKE MULTIPLIER	BL MULTIPLIER FOR PFA
FIXED & GUIDED		A	0.5	0.7
PIVOTED & GUIDED		B	0.7	0.7
FIXED & SUPPORTED		C	2	0.8
PIVOTED & GUIDED		C	2	0.9

Chart showing stroke factor for a specific cylinder mounting

ISO 6431, VDMA 24562 AIR CYLINDERS

FORCE/ROD BUCKLING CHARTS

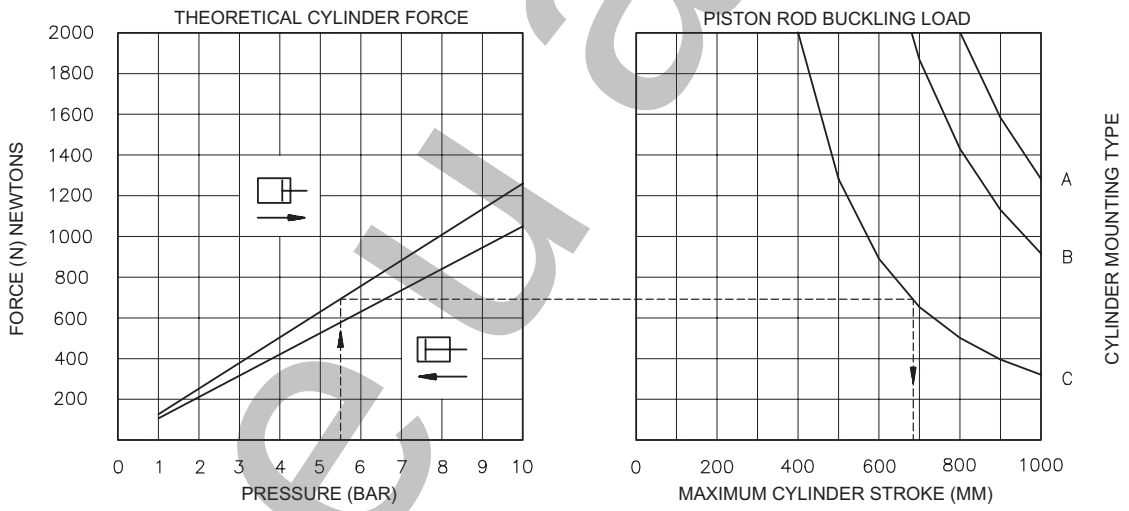
32mm BORE



CYLINDER FORCE EXTEND (N) = 80.4 x BAR

CYLINDER FORCE RETRACT (N) = 69.1 x BAR

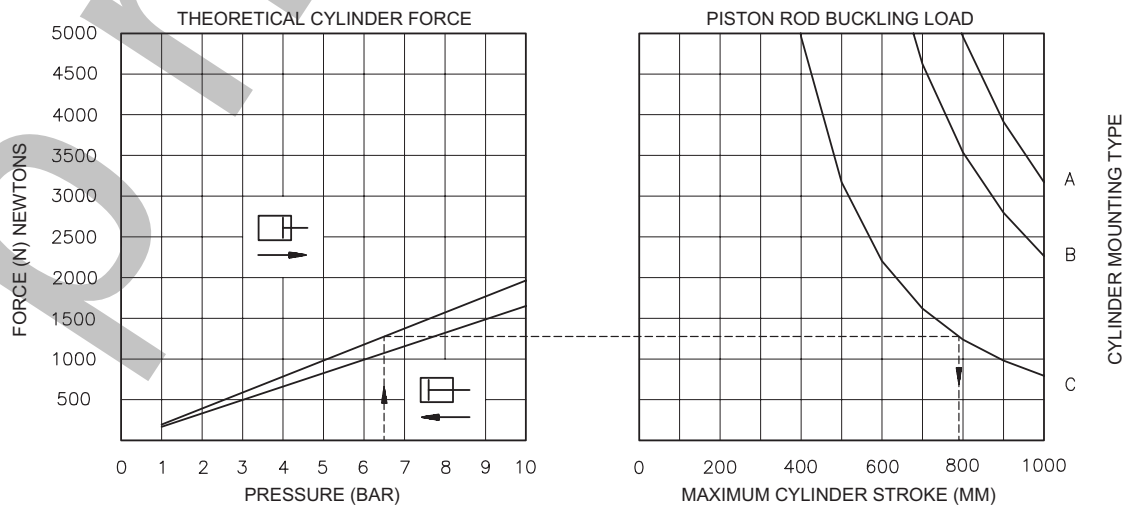
40mm BORE



CYLINDER FORCE EXTEND (N) = 125.6 x BAR

CYLINDER FORCE RETRACT (N) = 105.6 x BAR

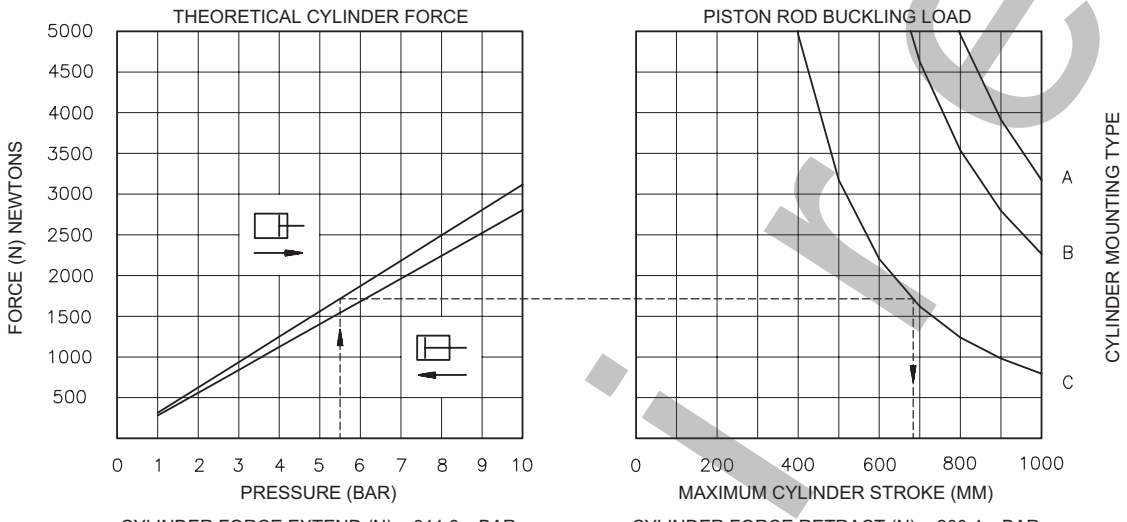
50mm BORE



CYLINDER FORCE EXTEND (N) = 196.4 x BAR

CYLINDER FORCE RETRACT (N) = 165 x BAR

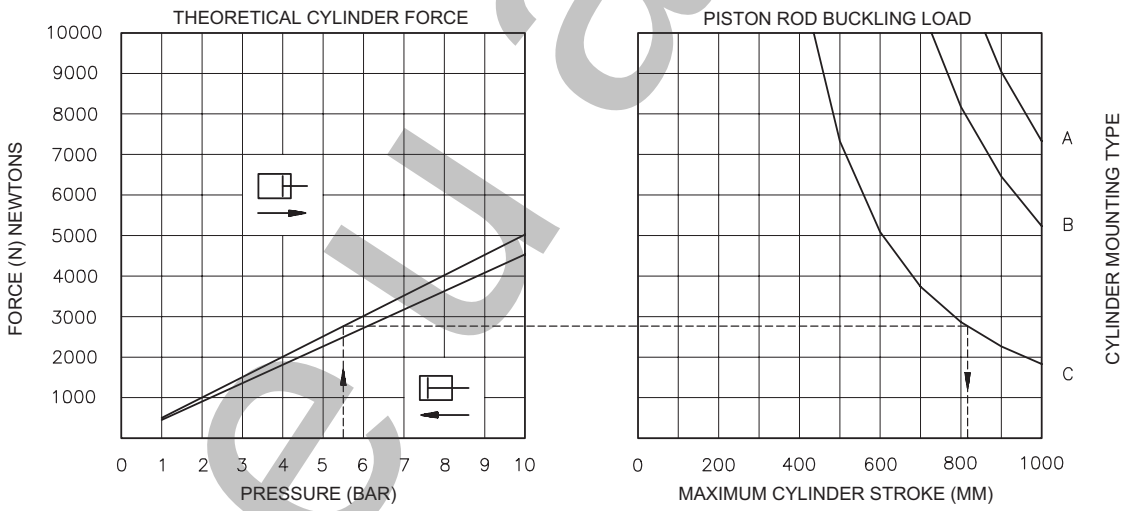
63mm BORE



CYLINDER FORCE EXTEND (N) = 311.8 x BAR

CYLINDER FORCE RETRACT (N) = 280.4 x BAR

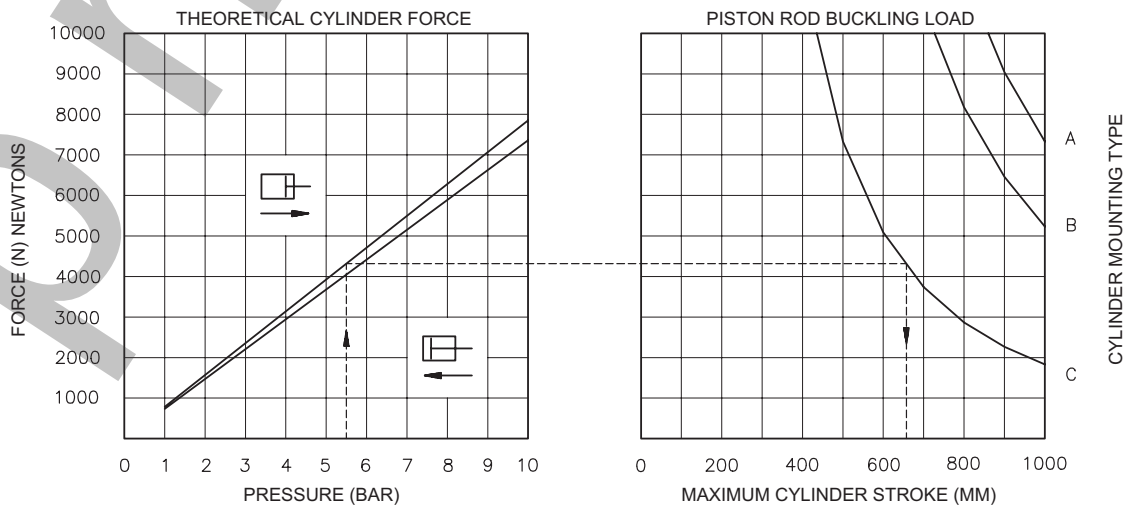
80mm BORE



CYLINDER FORCE EXTEND (N) = 502.6 x BAR

CYLINDER FORCE RETRACT (N) = 453.6 x BAR

100mm BORE



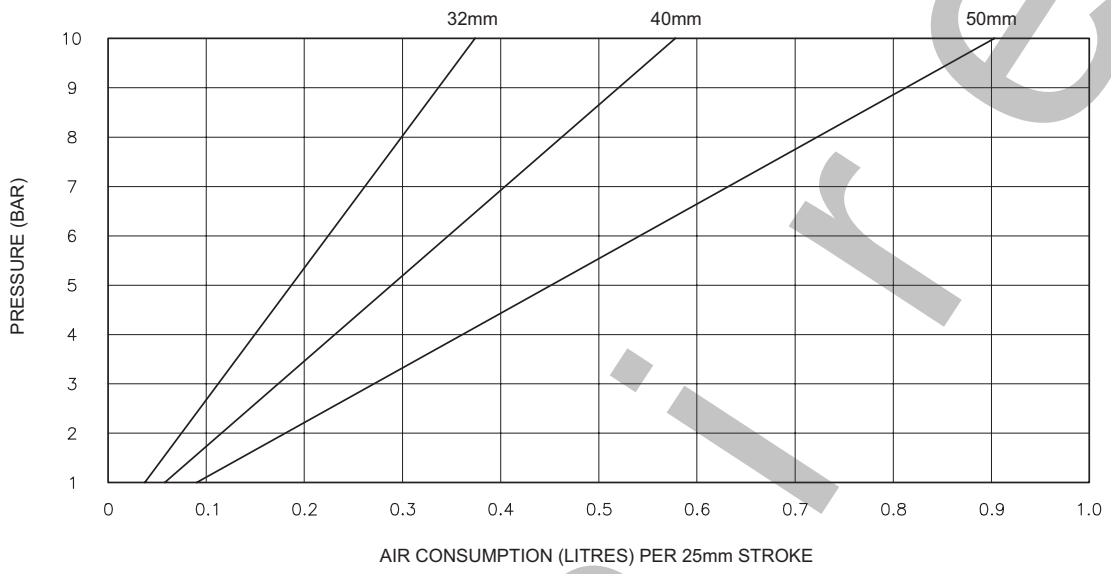
CYLINDER FORCE EXTEND (N) = 785.4 x BAR

CYLINDER FORCE RETRACT (N) = 736.4 x BAR

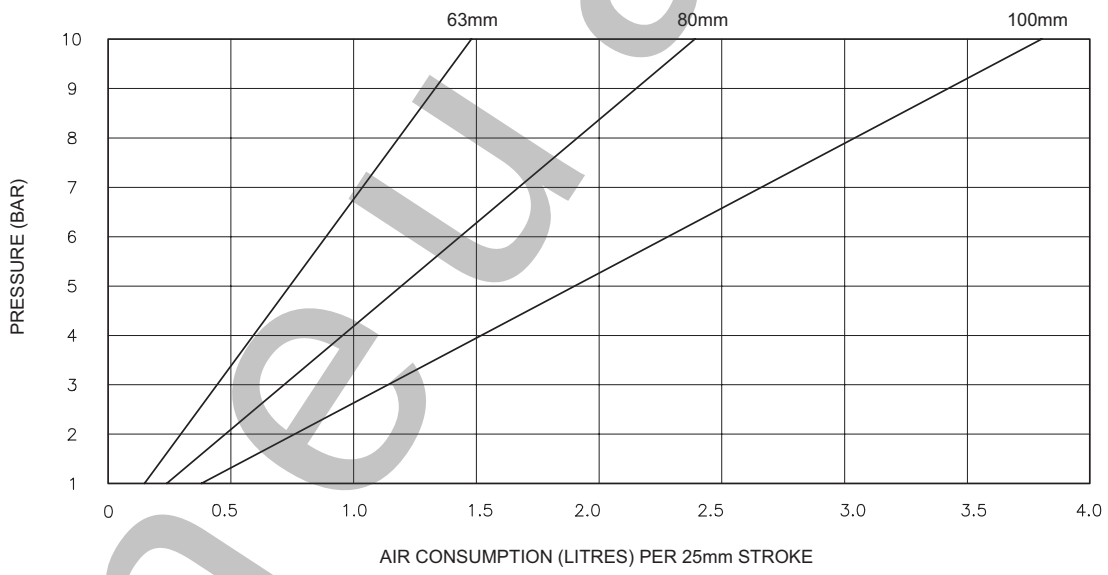
ISO 6431, VDMA 24562 AIR CYLINDERS

AIR CONSUMPTION CHARTS

32mm, 40mm and 50mm BORES



63mm, 80mm and 100mm BORES



The Air Consumption Charts are based on the following formula for a complete cylinder cycle: (cylinder extends and retracts):

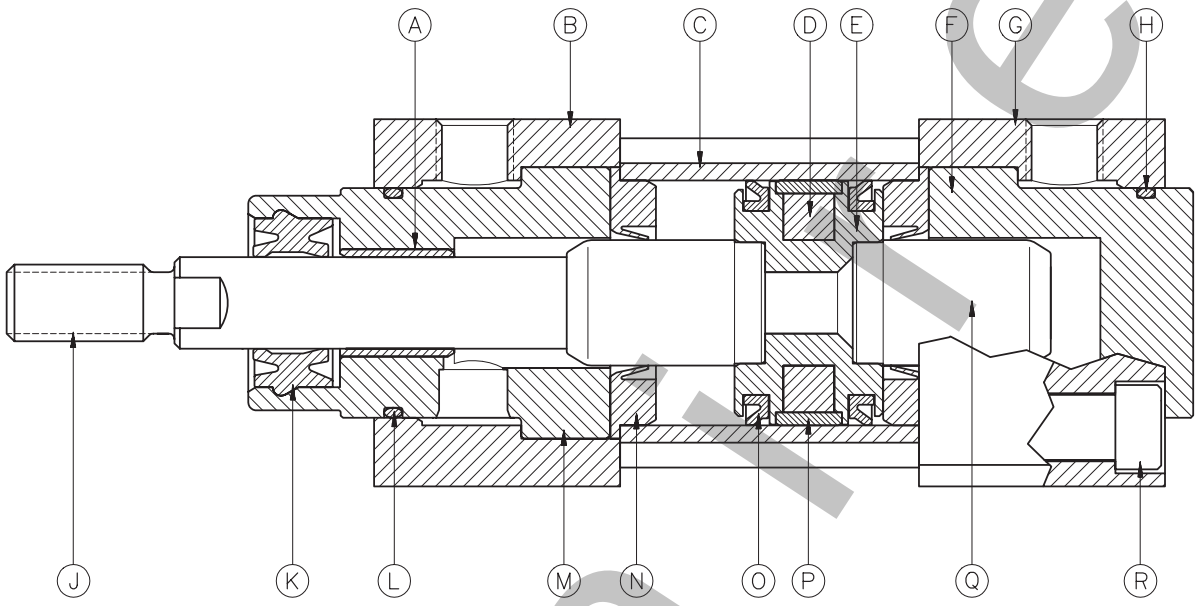
$$Q = \left[\frac{\pi D^2}{4} + \left(\frac{\pi(D^2 - d^2)}{4}\right)\right] hp10^{-6}$$

Q = Air volume per cm of stroke (L)
D = *Piston or piston rod diameter (mm)*
H = Stroke (Charts based on 25mm)
P = *Operating pressure (bar)*

EXAMPLE:

Cylinder Stroke	= 25mm
Cylinder Bore	= ø40
Operating Pressure	= 7 bar
Air Consumption	= 0.4 litres

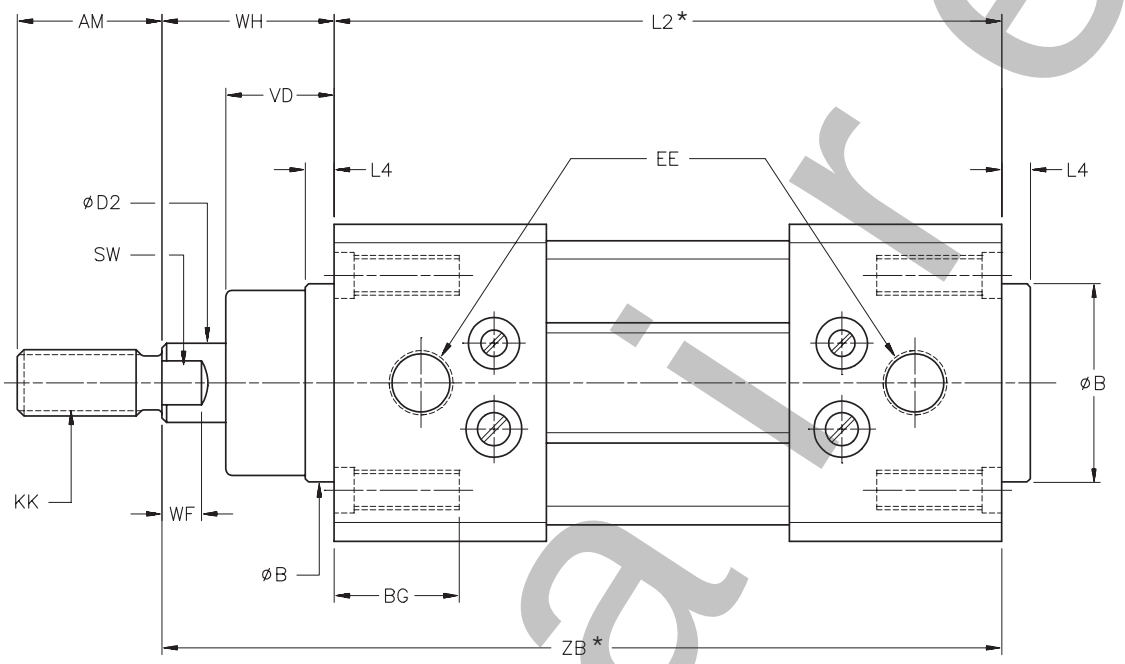
MATERIALS

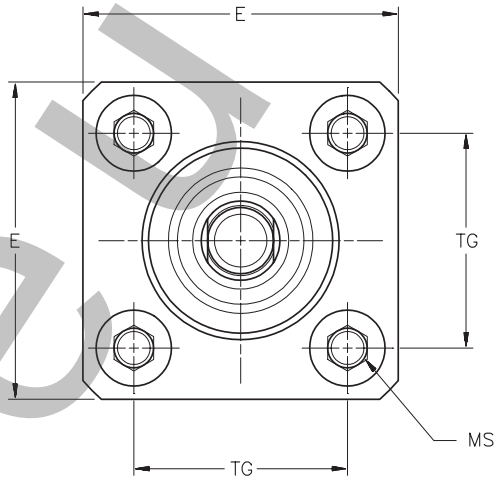


ITEM	COMPONENT	MATERIAL
A	Rod Bearing	Self Lubricating Thermoplastic Alloy
B	Front Retaining Block	Anodised Aluminium Alloy
C	Body	Anodised Aluminium Alloy
D	Magnet	Magnetic Polymer Matrix
E	Piston	Aluminium Alloy
F	Rear Head	Anodised Aluminium Alloy
G	Rear Retaining Block	Anodised Aluminium Alloy
H	Rear Head Seal	Fluoro-rubber
J	Piston Rod	Stainless Steel
K	Rod Seal/Rod Wiper	Polyurethane (Standard), Fluoro-rubber & Nitrile (Option)
L	Front Rod Guide Seal	Fluoro-rubber
M	Rod Guide	Anodised Aluminium Alloy
N	Cushion Seal/Bumper (2)	Polyurethane (Standard) or Fluoro-rubber (Option)
O	Piston Seal (2)	Polyurethane (Standard) or Fluoro-rubber (Option)
P	Piston Bearing Ring	Carbon Filled Polytetrafluoroethylene (PTFE)
Q	Cushion Sleeve (2)	Aluminium Alloy
R	Assembly Bolt (8)	Zinc Plated Steel

ISO 6431, VDMA 24562 AIR CYLINDERS

DIMENSIONS - SINGLE ENDED CYLINDERS

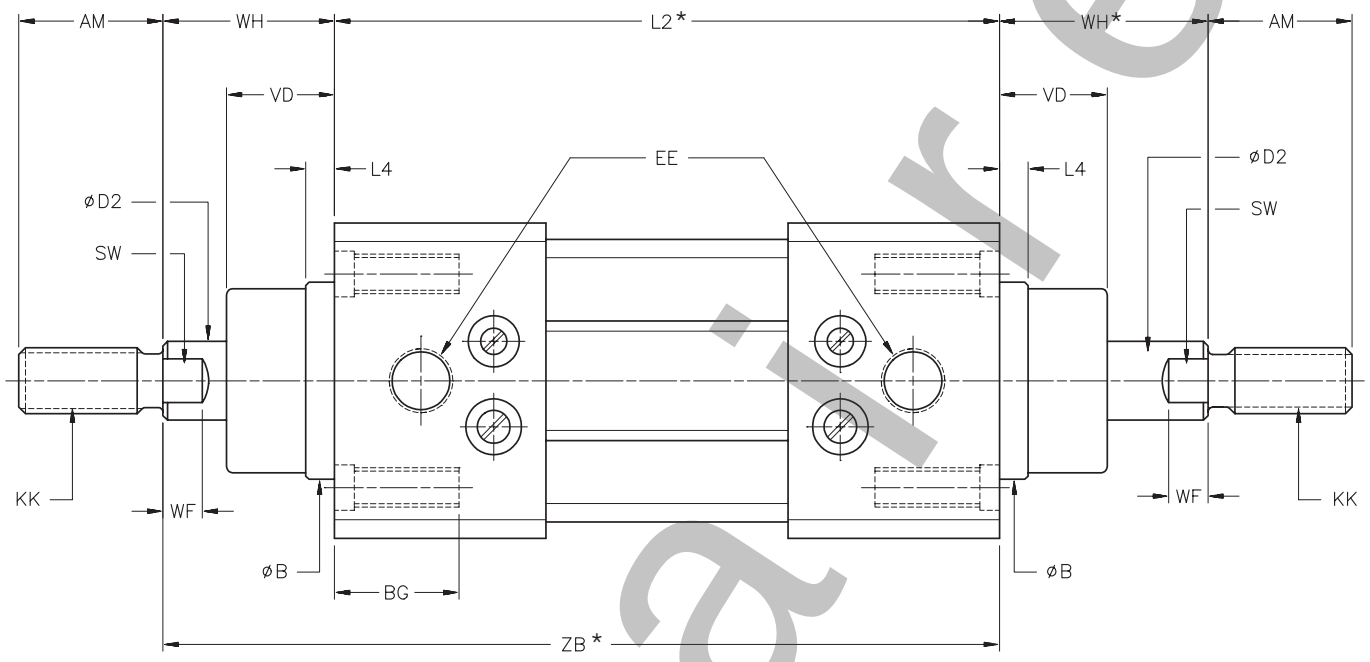


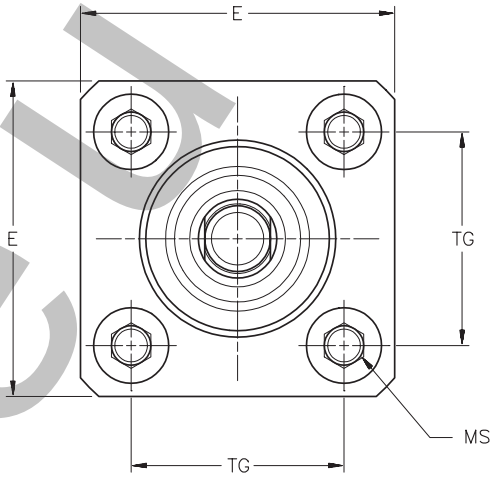


* - Plus Stroke

CYL Ø	B	D2	E	L2	L4	AM	BG	EE	KK	MS	TG	VD	WF	SW	WH	ZB
32	30	12	48	94	4	22	16	G1/8	M10x1.25	M6	32.5	16	6	10	26	120
40	35	16	54	105	4	24	16	G1/4	M12x1.25	M6	38	19	6	13	30	135
50	40	20	66	106	4	32	16	G1/4	M16x1.5	M8	46.5	25	8	16	37	143
63	45	20	76	121	4	32	16	G3/8	M16x1.5	M8	56.5	25	8	16	37	158
80	45	25	95	128	4	40	16	G3/8	M20x1.5	M10	72	32	10	21	46	174
100	55	25	114	138	4	40	16	G1/2	M20x1.5	M10	89	34	10	21	51	189

DOUBLE ENDED CYLINDERS





* - Plus Stroke

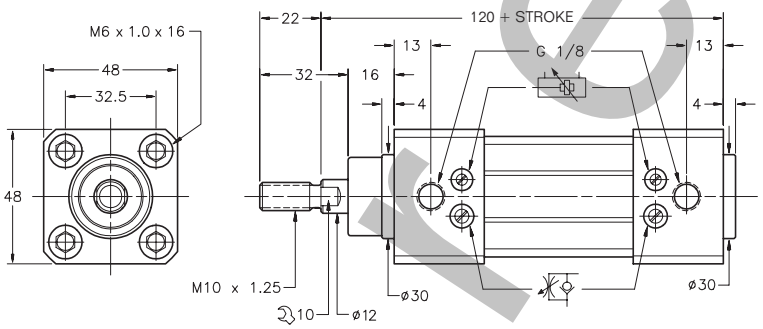
CYL Ø	B	D2	E	L2	L4	AM	BG	EE	KK	MS	TG	VD	WF	SW	WH	ZB
32	30	12	48	94	4	22	16	G1/8	M10x1.25	M6	32.5	16	6	10	26	120
40	35	16	54	105	4	24	16	G1/4	M12x1.25	M6	38	19	6	13	30	135
50	40	20	66	106	4	32	16	G1/4	M16x1.5	M8	46.5	25	8	16	37	143
63	45	20	76	121	4	32	16	G3/8	M16x1.5	M8	56.5	25	8	16	37	158
80	45	25	95	128	4	40	16	G3/8	M20x1.5	M10	72	32	10	21	46	174
100	55	25	114	138	4	40	16	G1/2	M20x1.5	M10	89	34	10	21	51	189

ISO 6431, VDMA 24562 AIR CYLINDERS

32mm BORE

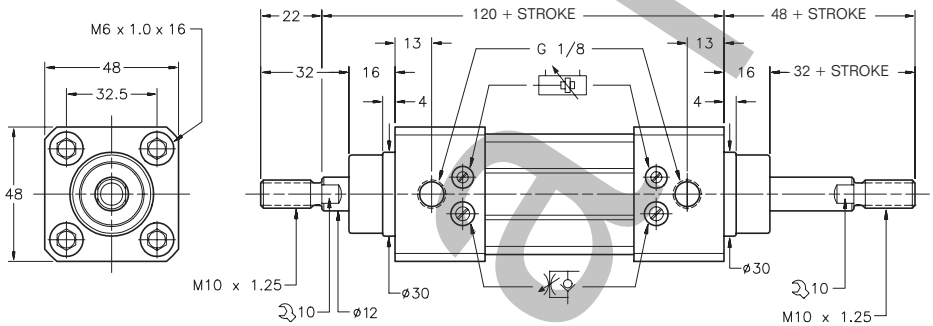
BASIC CYLINDER (Without Mounting Kit)

Total Weight (with 0mm stroke): 0.599kg
Additional Weight (per mm stroke): 0.003kg

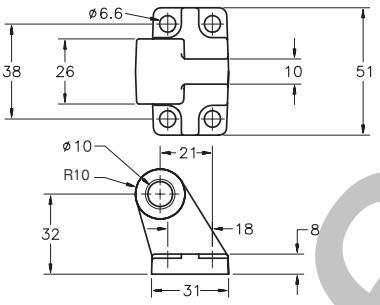


DOUBLE ENDED CYLINDER (Without Mounting Kit)

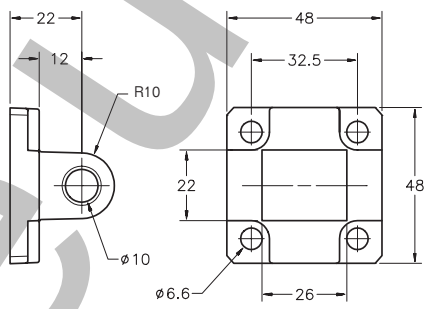
Total Weight (with 0mm stroke): 0.690kg
Additional Weight (per mm stroke): 0.003kg



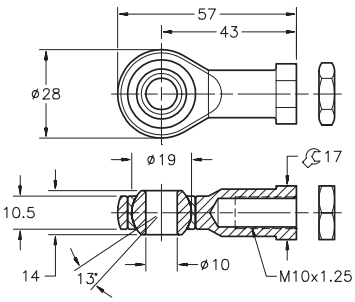
ACCESSORIES



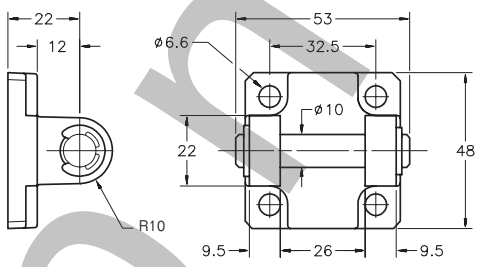
PB1-32 - 0.058kg
PIVOT BRACKET - TYPE 1



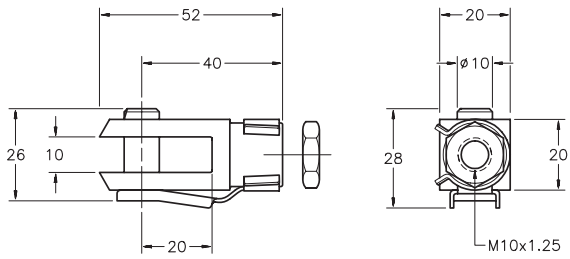
PB2-32 - 0.059kg
PIVOT BRACKET - TYPE 2



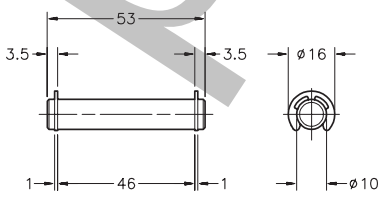
SRE-M10x1.25 - 0.080kg
SPHERICAL ROD EYE



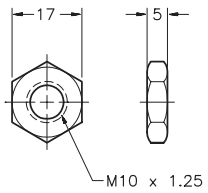
CB-32 - 0.086kg
CLEVIS BRACKET



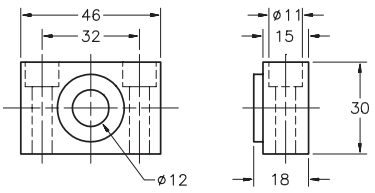
RC-M10x1.25 - 0.097kg
ROD CLEVIS



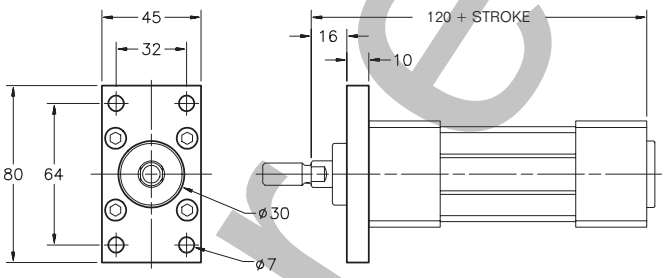
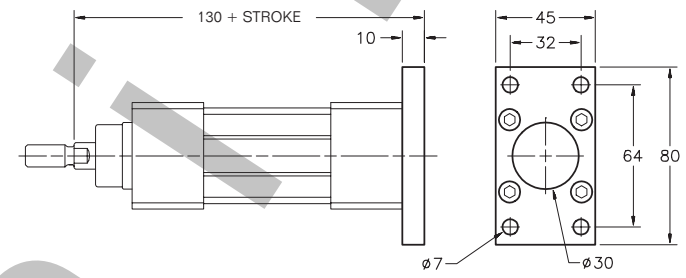
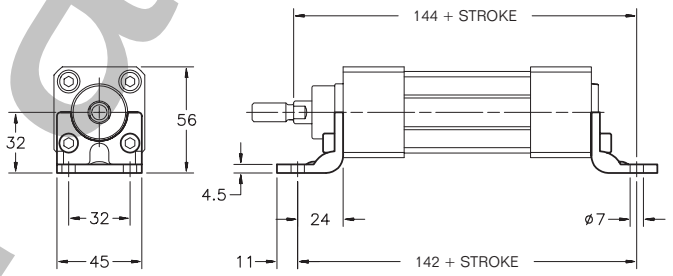
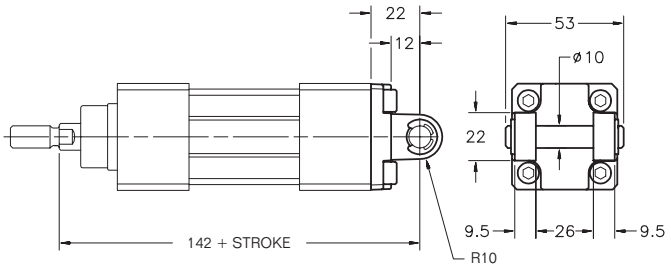
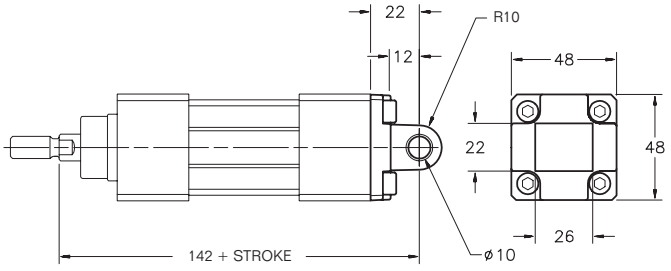
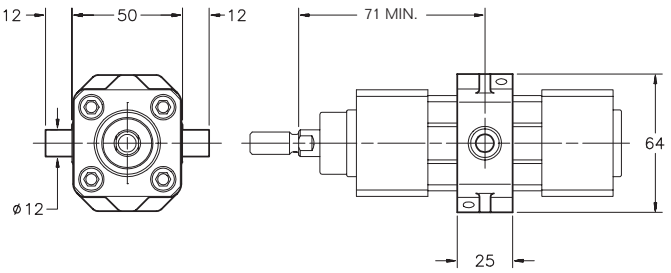
PP-32 - 0.035kg
PIVOT PIN



RN-4 - 0.006kg
ROD NUT



TB-32 - 0.041kg
TRUNNION MOUNTING BLOCK

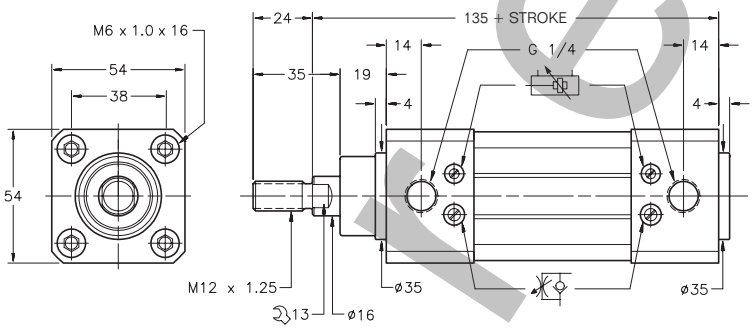
MOUNTING KITS	DESCRIPTION	DIMENSIONS
MF-32 	**FRONT FLANGE MOUNTING KIT** *(ISO TYPE MF1)* Consists of: 1 Flange 4 Fixing Screws Weight: 0.218kg	
MF-32 	**REAR FLANGE MOUNTING KIT** *(ISO TYPE MF2)* Consists of: 1 Flange 4 Fixing Screws Weight: 0.218kg	
MS1-32 	**FOOT BRACKET MOUNTING KIT** Consists of: 2 Foot Brackets 4 Fixing Screws Weight: 0.156kg	
MP2-32 	**CLEVIS MOUNTING KIT** Consists of: 1 Clevis Bracket 4 Fixing Screws 1 Pivot Pin 2 Circlips Weight: 0.111kg	
MP4-32 	**PIVOT MOUNTING KIT** Consists of: 1 Pivot Bracket 4 Fixing Screws Weight: 0.081kg	
MT-32 	**TRUNNION MOUNTING KIT** Consists of: 1 Centre Trunnion 4 Set Screws Weight: 0.121kg	

ISO 6431, VDMA 24562 AIR CYLINDERS

40mm BORE

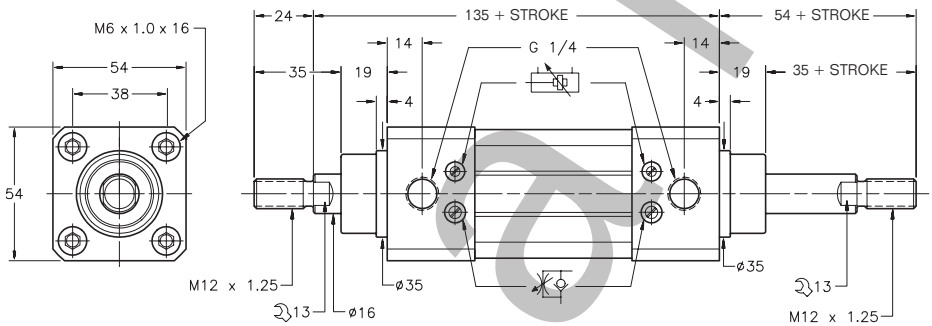
BASIC CYLINDER (Without Mounting Kit)

Total Weight (with 0mm stroke): 0.890kg
Additional Weight (per mm stroke): 0.005kg

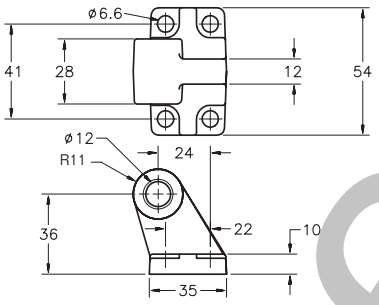


DOUBLE ENDED CYLINDER (Without Mounting Kit)

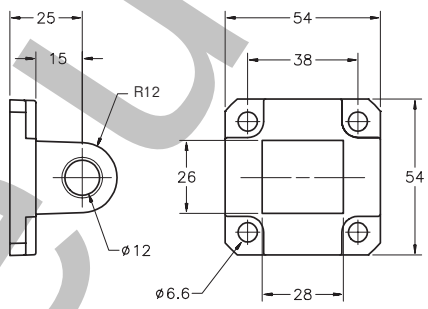
Total Weight (with 0mm stroke): 1.055kg
Additional Weight (per mm stroke): 0.006kg



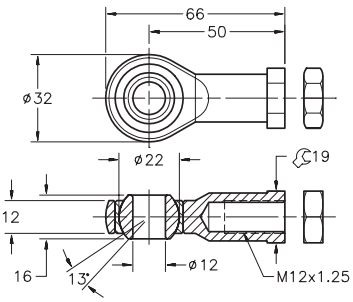
ACCESSORIES



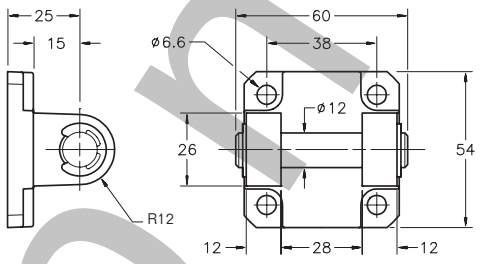
PB1-40 - 0.083kg
PIVOT BRACKET - TYPE 1



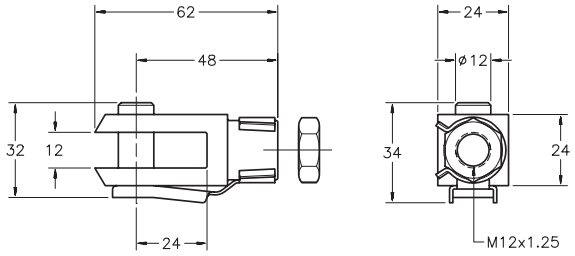
PB2-40 - 0.083kg
PIVOT BRACKET - TYPE 2



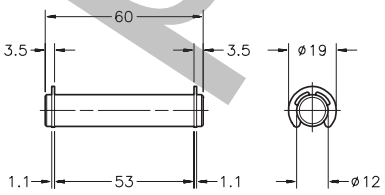
SRE-M12x1.25 - 0.124kg
SPHERICAL ROD EYE



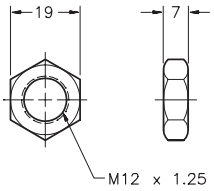
CB-40 - 0.130kg
CLEVIS BRACKET



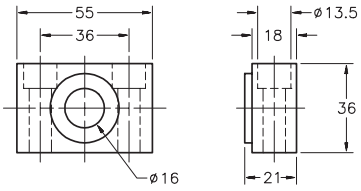
RC-M12x1.25 - 0.157kg
ROD CLEVIS



PP-40 - 0.055kg
PIVOT PIN

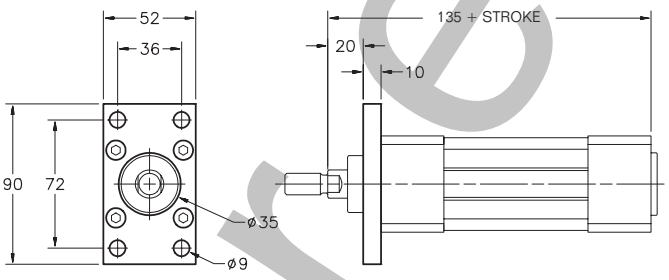
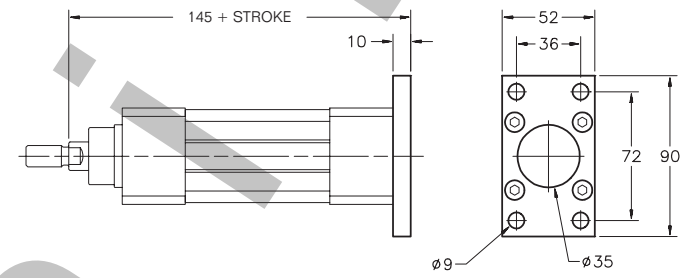
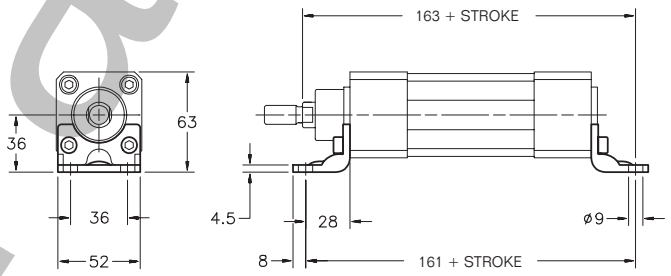
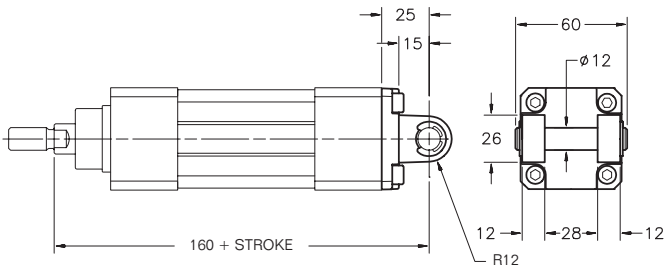
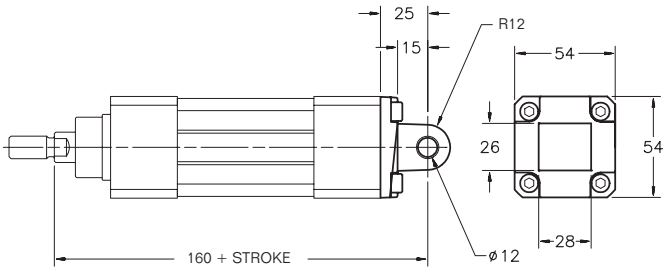
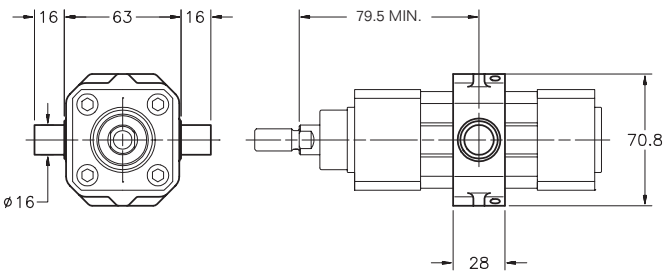


MN-1 - 0.010kg
ROD NUT



TB-40 - 0.067kg
TRUNNION MOUNTING BLOCK

ISO 6431, VDMA 24562 AIR CYLINDERS

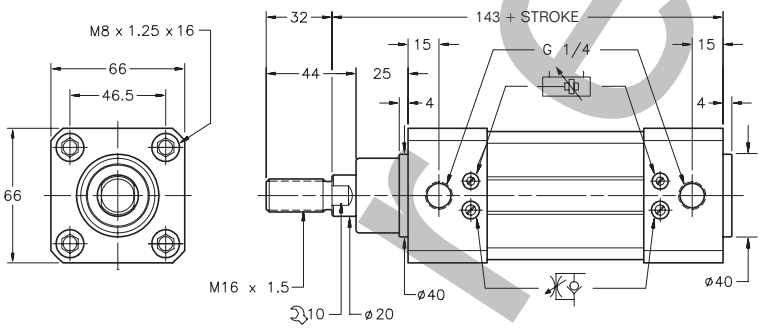
MOUNTING KITS	DESCRIPTION	DIMENSIONS
MF-40 	**FRONT FLANGE MOUNTING KIT** *(ISO TYPE MF1)* Consists of: 1 Flange 4 Fixing Screws Weight: 0.270kg	
MF-40 	**REAR FLANGE MOUNTING KIT** *(ISO TYPE MF2)* Consists of: 1 Flange 4 Fixing Screws Weight: 0.270kg	
MS1-40 	**FOOT BRACKET MOUNTING KIT** Consists of: 2 Foot Brackets 4 Fixing Screws Weight: 0.186kg	
MP2-40 	**CLEVIS MOUNTING KIT** Consists of: 1 Clevis Bracket 4 Fixing Screws 1 Pivot Pin 2 Circlips Weight: 0.157kg	
MP4-40 	**PIVOT MOUNTING KIT** Consists of: 1 Pivot Bracket 4 Fixing Screws Weight: 0.108kg	
MT-40 	**TRUNNION MOUNTING KIT** Consists of: 1 Centre Trunnion 4 Set Screws Weight: 0.221kg	

ISO 6431, VDMA 24562 AIR CYLINDERS

50mm BORE

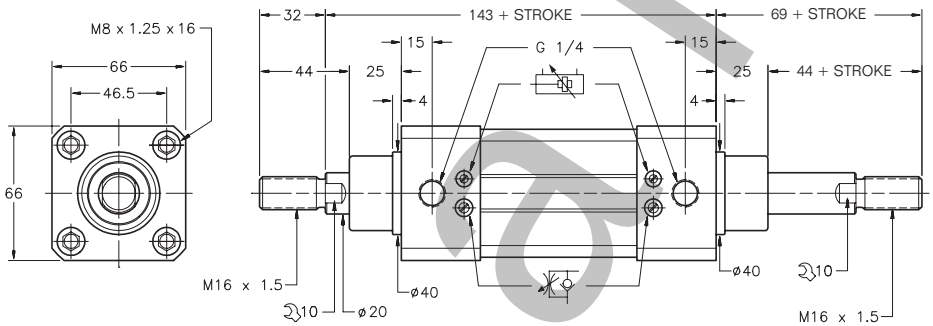
BASIC CYLINDER (Without Mounting Kit)

Total Weight (with 0mm stroke): 1.440kg
Additional Weight (per mm stroke): 0.006kg

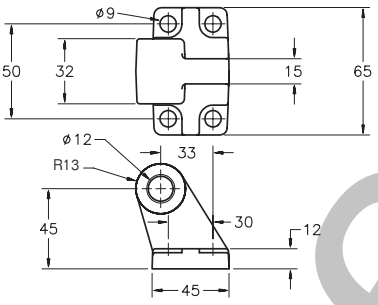


DOUBLE ENDED CYLINDER (Without Mounting Kit)

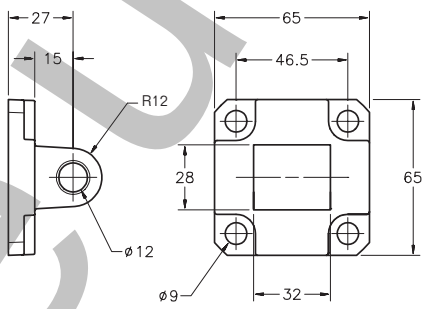
Total Weight (with 0mm stroke): 1.755kg
Additional Weight (per mm stroke): 0.008kg



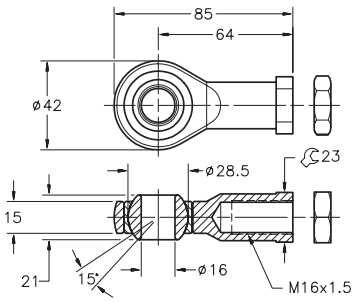
ACCESSORIES



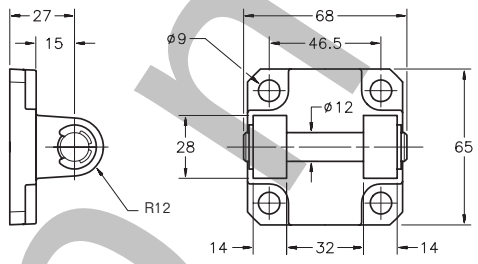
PB1-50 - 0.153kg
PIVOT BRACKET - TYPE 1



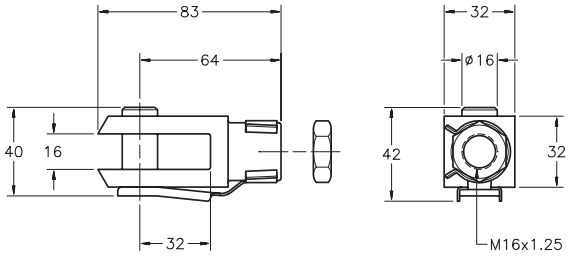
PB2-50 - 0.123kg
PIVOT BRACKET - TYPE 2



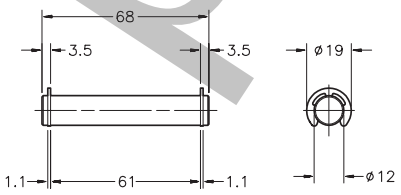
SRE-M16x1.5 - 0.248kg
SPHERICAL ROD EYE



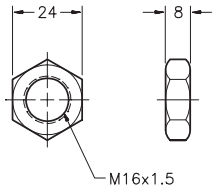
CB-50 - 0.183kg
CLEVIS BRACKET



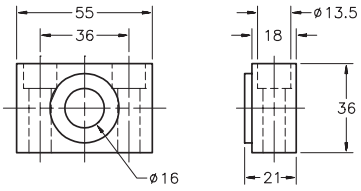
RC-M16x1.5 - 0.356kg
ROD CLEVIS



PP-50 - 0.060kg
PIVOT PIN

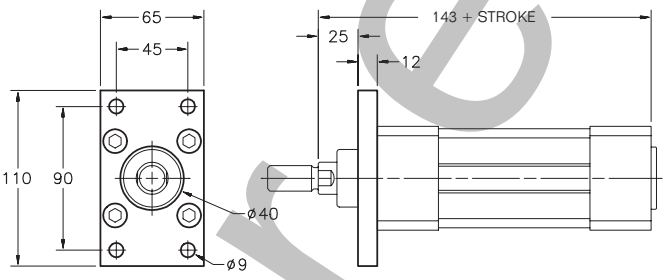
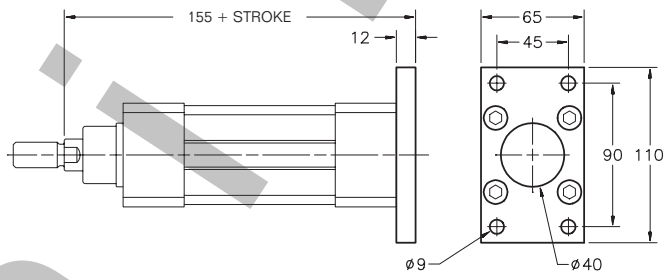
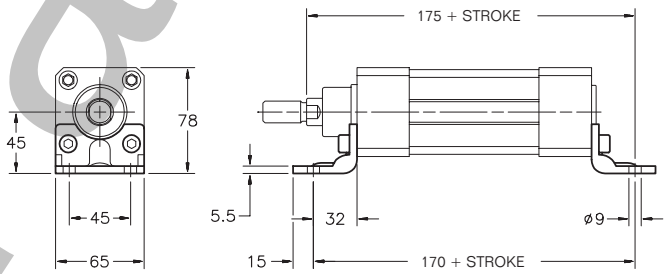
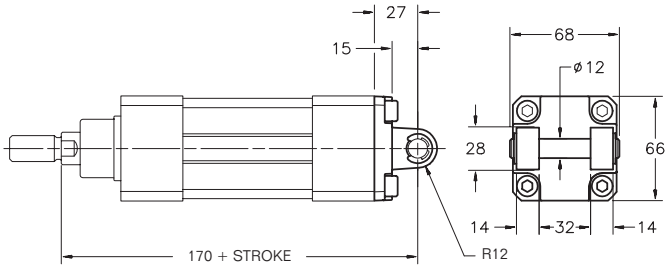
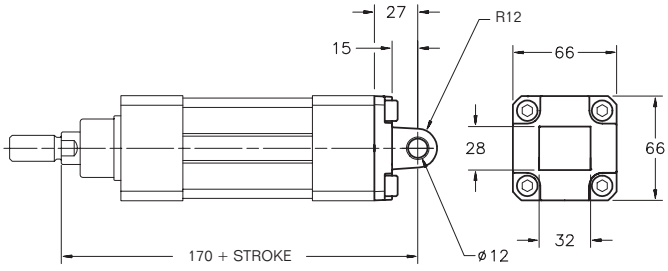
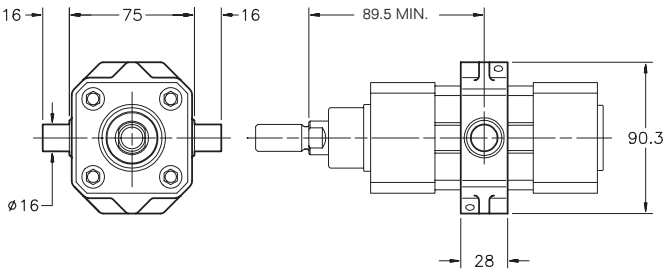


MN-2 - 0.017kg
ROD NUT



TB-50 - 0.067kg
TRUNNION MOUNTING BLOCK

ISO 6431, VDMA 24562 AIR CYLINDERS

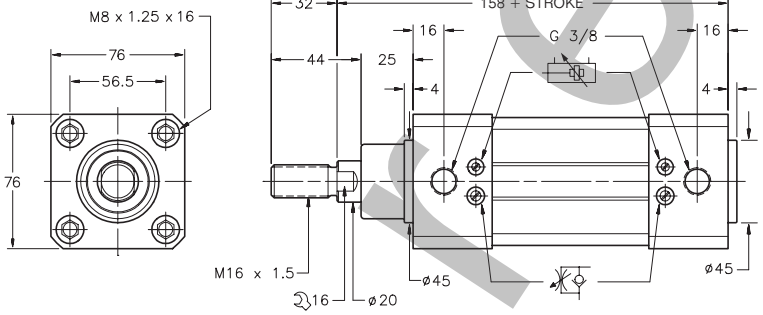
MOUNTING KITS	DESCRIPTION	DIMENSIONS
MF-50 	**FRONT FLANGE MOUNTING KIT** *(ISO TYPE MF1)* Consists of: 1 Flange 4 Fixing Screws Weight: 0.522kg	
MF-50 	**REAR FLANGE MOUNTING KIT** *(ISO TYPE MF2)* Consists of: 1 Flange 4 Fixing Screws Weight: 0.522kg	
MS1-50 	**FOOT BRACKET MOUNTING KIT** Consists of: 2 Foot Brackets 4 Fixing Screws Weight: 0.388kg	
MP2-50 	**CLEVIS MOUNTING KIT** Consists of: 1 Clevis Bracket 4 Fixing Screws 1 Pivot Pin 2 Circlips Weight: 0.234kg	
MP4-50 	**PIVOT MOUNTING KIT** Consists of: 1 Pivot Bracket 4 Fixing Screws Weight: 0.174kg	
MT-50 	**TRUNNION MOUNTING KIT** Consists of: 1 Centre Trunnion 4 Set Screws Weight: 0.314kg	

ISO 6431, VDMA 24562 AIR CYLINDERS

63mm BORE

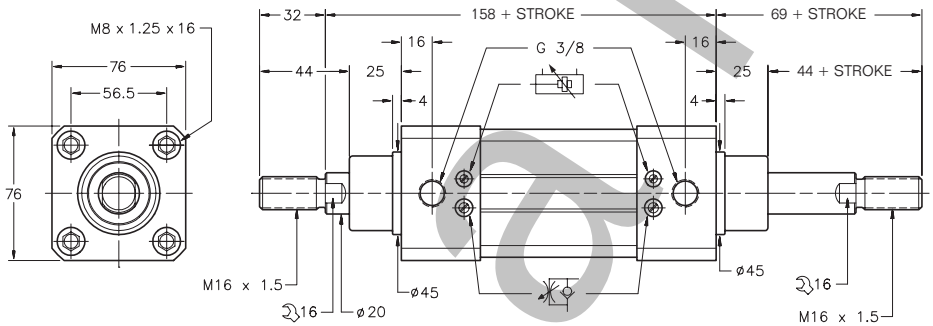
BASIC CYLINDER (Without Mounting Kit)

Total Weight (with 0mm stroke): 2.080kg
Additional Weight (per mm stroke): 0.008kg

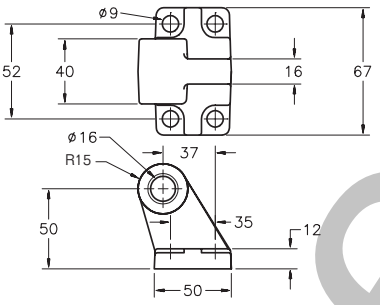


DOUBLE ENDED CYLINDER (Without Mounting Kit)

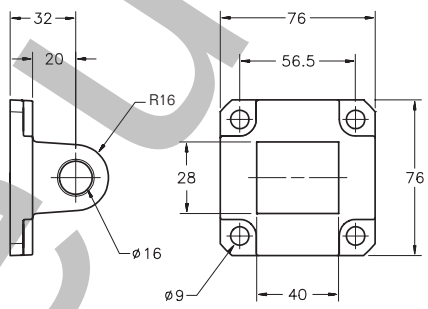
Total Weight (with 0mm stroke): 2.400kg
Additional Weight (per mm stroke): 0.010kg



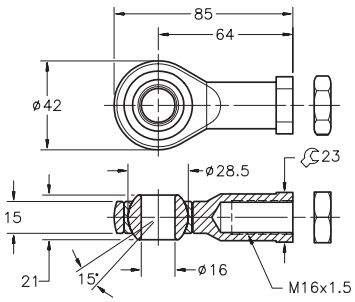
ACCESSORIES



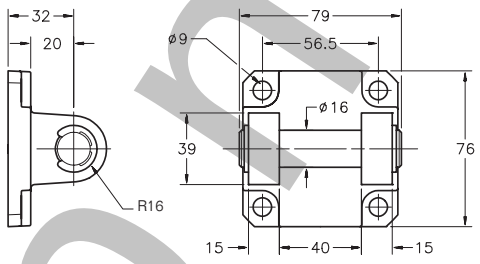
PB1-63 - 0.203kg
PIVOT BRACKET - TYPE 1



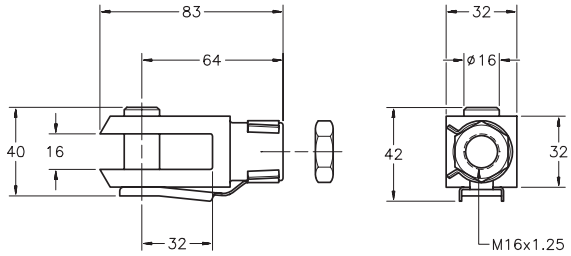
PB2-63 - 0.206kg
PIVOT BRACKET - TYPE 2



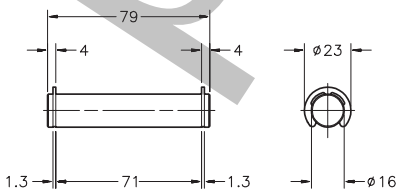
SRE-M16x1.5 - 0.248kg
SPHERICAL ROD EYE



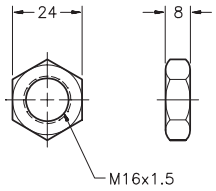
CB-63 - 0.322kg
CLEVIS BRACKET



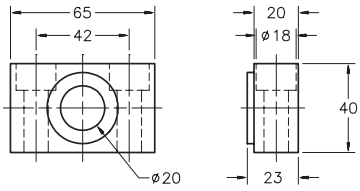
RC-M16x1.5 - 0.356kg
ROD CLEVIS



PP-63 - 0.127kg
PIVOT PIN

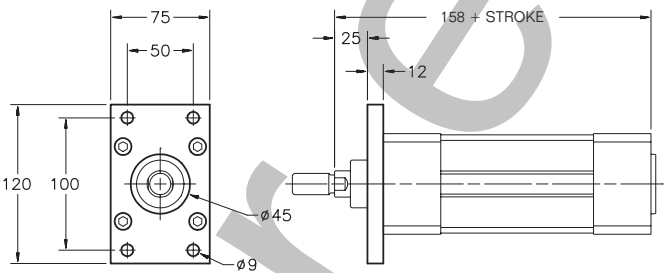
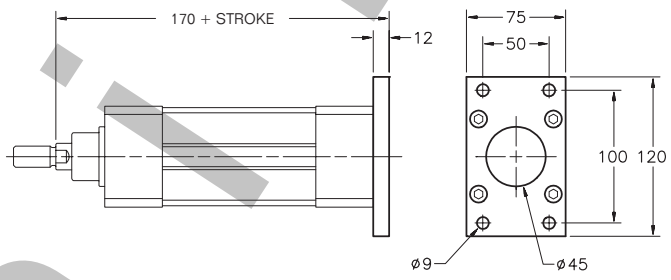
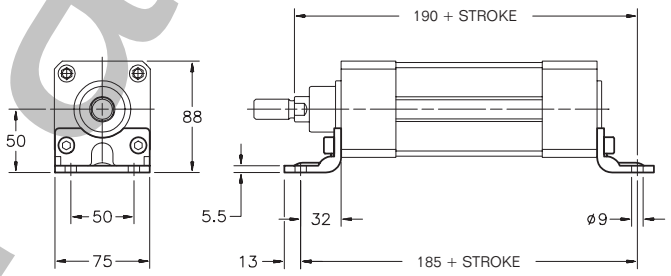
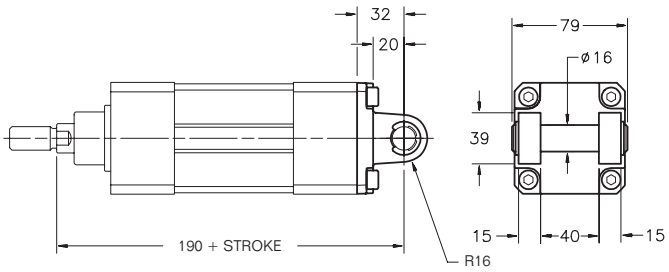
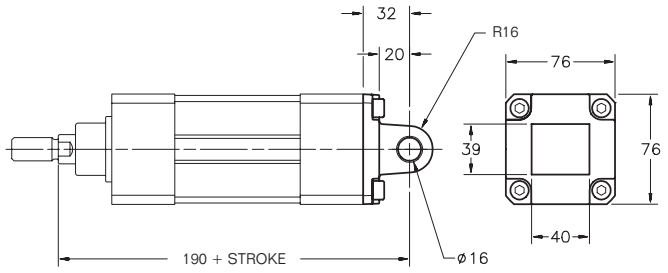
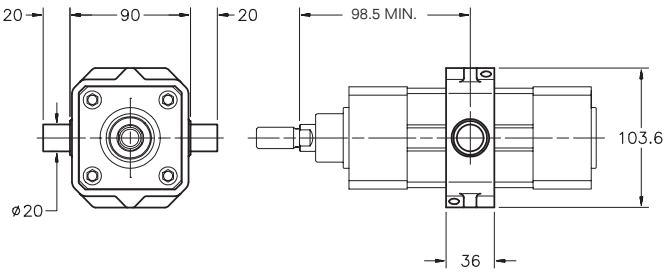


MN-2 - 0.017kg
ROD NUT



TB-63 - 0.089kg
TRUNNION MOUNTING BLOCK

ISO 6431, VDMA 24562 AIR CYLINDERS

MOUNTING KITS	DESCRIPTION	DIMENSIONS
MF-63 	**FRONT FLANGE MOUNTING KIT** *(ISO TYPE MF1)* Consists of: 1 Flange 4 Fixing Screws Weight: 0.667kg	
MF-63 	**REAR FLANGE MOUNTING KIT** *(ISO TYPE MF2)* Consists of: 1 Flange 4 Fixing Screws Weight: 0.667kg	
MS1-63 	**FOOT BRACKET MOUNTING KIT** Consists of: 2 Foot Brackets 4 Fixing Screws Weight: 0.438kg	
MP2-63 	**CLEVIS MOUNTING KIT** Consists of: 1 Clevis Bracket 4 Fixing Screws 1 Pivot Pin 2 Circlips Weight: 0.376kg	
MP4-63 	**PIVOT MOUNTING KIT** Consists of: 1 Pivot Bracket 4 Fixing Screws Weight: 0.257kg	
MT-63 	**TRUNNION MOUNTING KIT** Consists of: 1 Centre Trunnion 4 Set Screws Weight: 0.547kg	

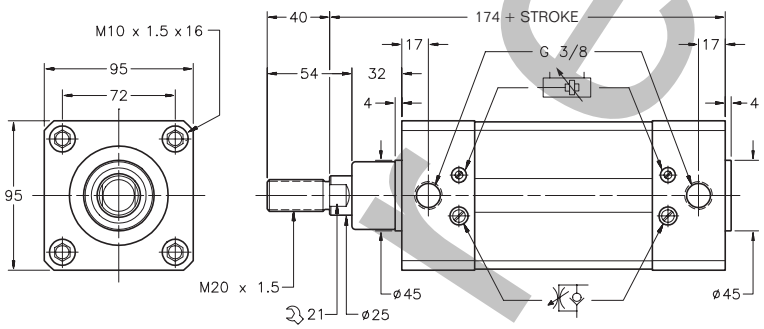
ORDER ONLINE

ISO 6431, VDMA 24562 AIR CYLINDERS

80mm BORE

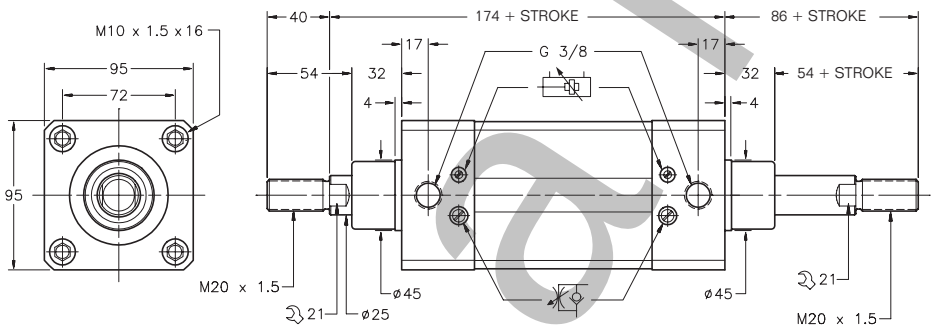
BASIC CYLINDER (Without Mounting Kit)

Total Weight (with 0mm stroke): 3.430kg
Additional Weight (per mm stroke): 0.010kg

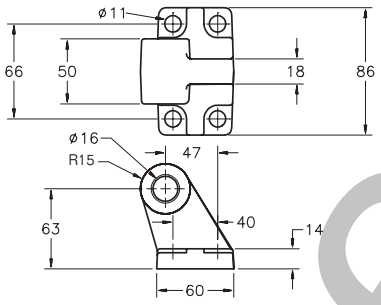


DOUBLE ENDED CYLINDER (Without Mounting Kit)

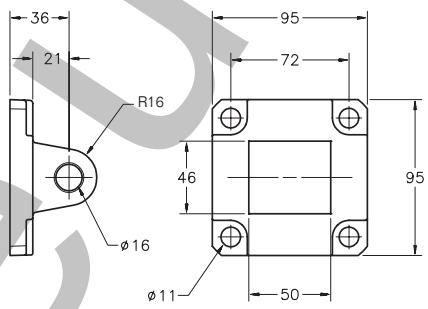
Total Weight (with 0mm stroke): 4.055kg
Additional Weight (per mm stroke): 0.014kg



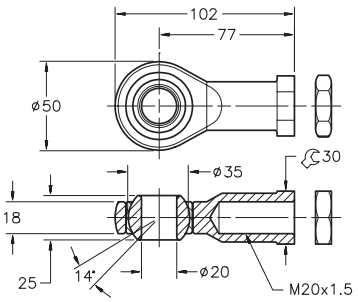
ACCESSORIES



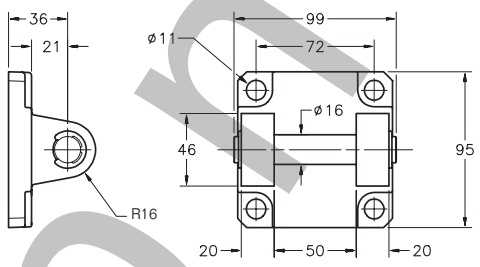
PB1-80 - 0.331kg
PIVOT BRACKET - TYPE 1



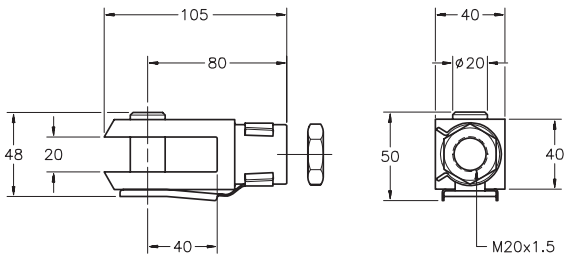
PB2-80 - 0.393kg
PIVOT BRACKET - TYPE 2



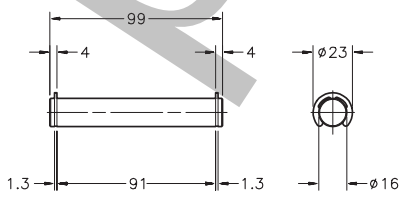
SRE-M20x1.5 - 0.438kg
SPHERICAL ROD EYE



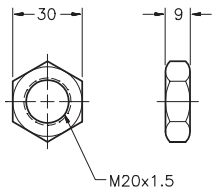
CB-80 - 0.543kg
CLEVIS BRACKET



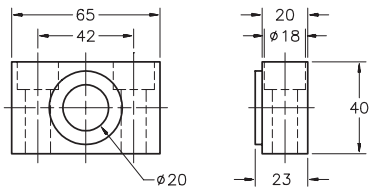
RC-M20x1.5 - 0.714kg
ROD CLEVIS



PP-80 - 0.160kg
PIVOT PIN

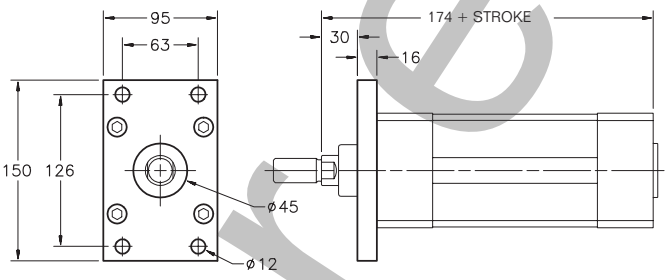
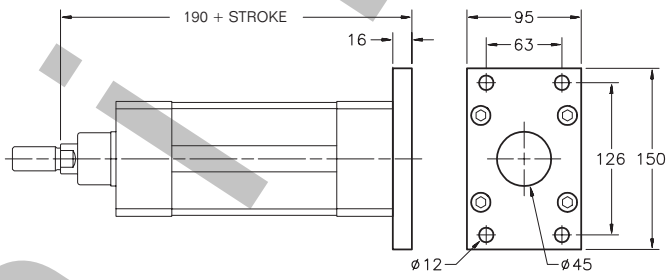
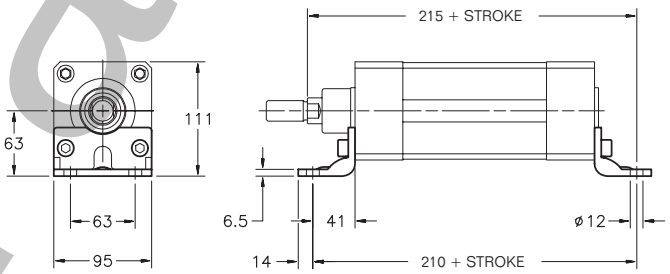
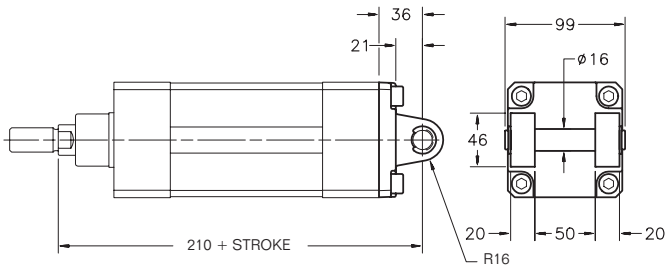
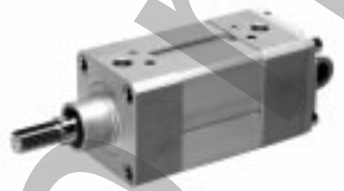
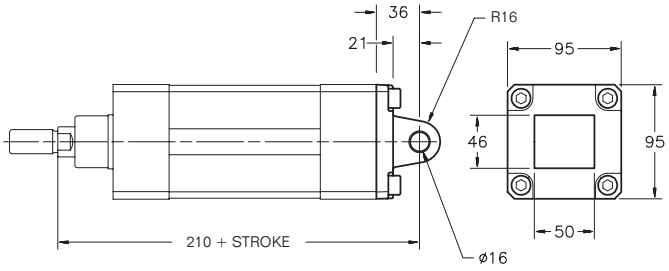
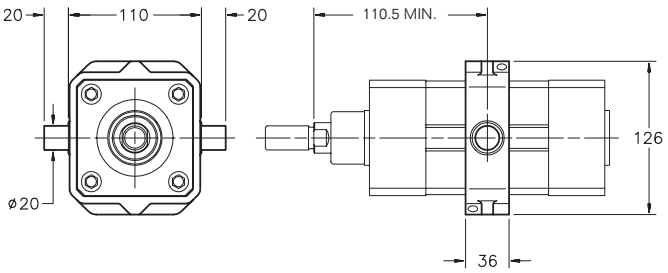


MN-5 - 0.030kg
ROD NUT



TB-80 - 0.089kg
TRUNNION MOUNTING BLOCK

ISO 6431, VDMA 24562 AIR CYLINDERS

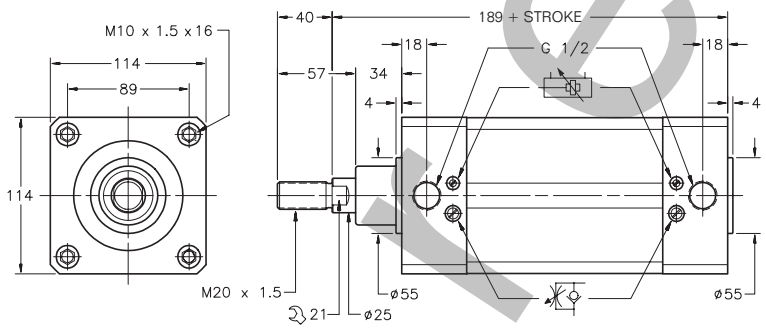
MOUNTING KITS	DESCRIPTION	DIMENSIONS
MF-80 	**FRONT FLANGE MOUNTING KIT** *(ISO TYPE MF1)* Consists of: 1 Flange 4 Fixing Screws Weight: 1.505kg	
MF-80 	**REAR FLANGE MOUNTING KIT** *(ISO TYPE MF2)* Consists of: 1 Flange 4 Fixing Screws Weight: 1.505kg	
MS1-80 	**FOOT BRACKET MOUNTING KIT** Consists of: 2 Foot Brackets 4 Fixing Screws Weight: 0.846kg	
MP2-80 	**CLEVIS MOUNTING KIT** Consists of: 1 Clevis Bracket 4 Fixing Screws 1 Pivot Pin 2 Circlips Weight: 0.639kg	
MP4-80 	**PIVOT MOUNTING KIT** Consists of: 1 Pivot Bracket 4 Fixing Screws Weight: 0.483kg	
MT-80 	**TRUNNION MOUNTING KIT** Consists of: 1 Centre Trunnion 4 Set Screws Weight: 0.733kg	

ISO 6431, VDMA 24562 AIR CYLINDERS

100mm BORE

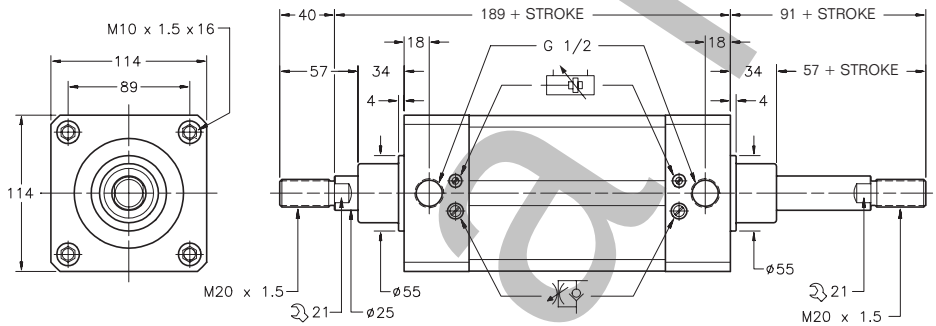
BASIC CYLINDER (Without Mounting Kit)

Total Weight (with 0mm stroke): 4.850kg
Additional Weight (per mm stroke): 0.012kg

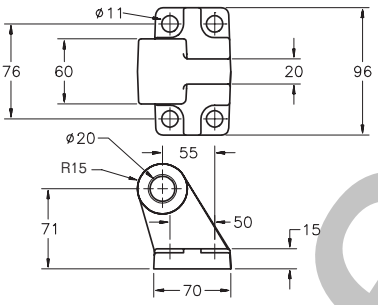


DOUBLE ENDED CYLINDER (Without Mounting Kit)

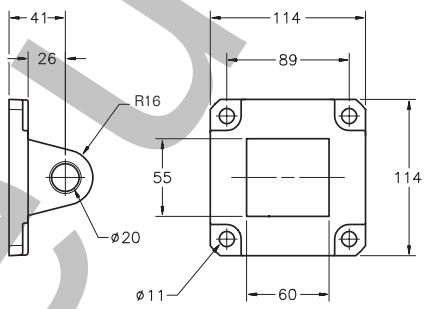
Total Weight (with 0mm stroke): 5.545kg
Additional Weight (per mm stroke): 0.015kg



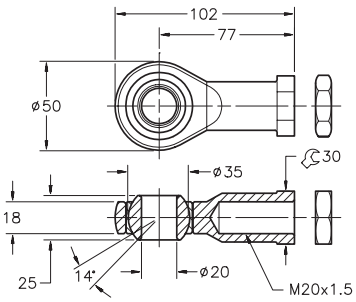
ACCESSORIES



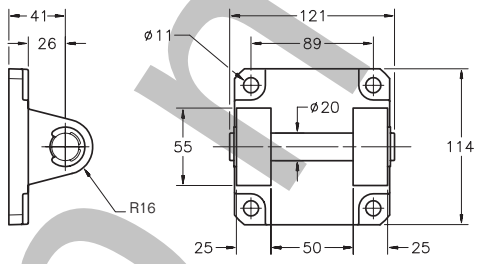
PB1-100 - 0.512kg
PIVOT BRACKET - TYPE 1



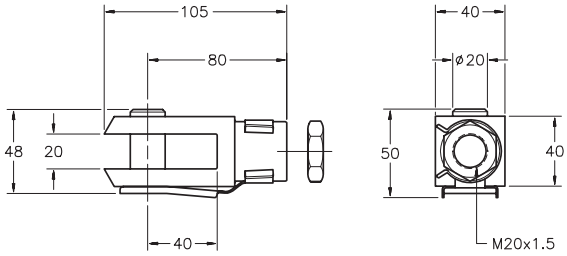
PB2-100 - 0.601kg
PIVOT BRACKET - TYPE 2



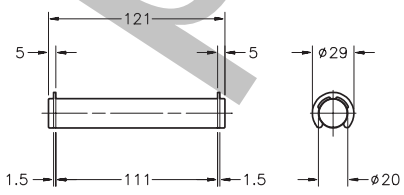
SRE-M20x1.5 - 0.438kg
SPHERICAL ROD EYE



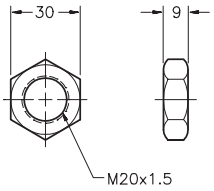
CB-100 - 0.909kg
CLEVIS BRACKET



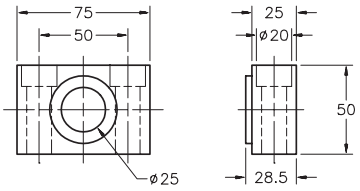
RC-M20x1.5 - 0.714kg
ROD CLEVIS



PP-100 - 0.300kg
PIVOT PIN

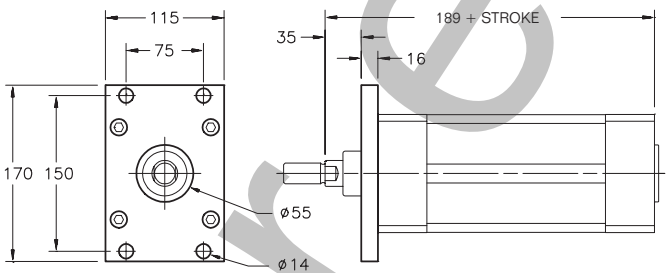
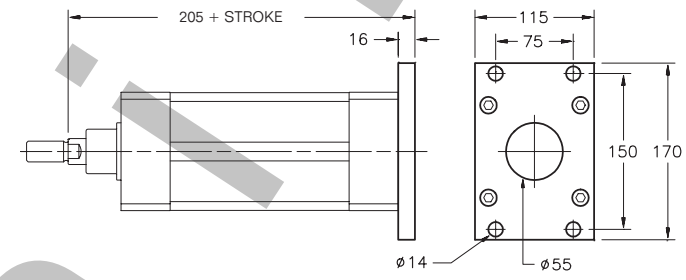
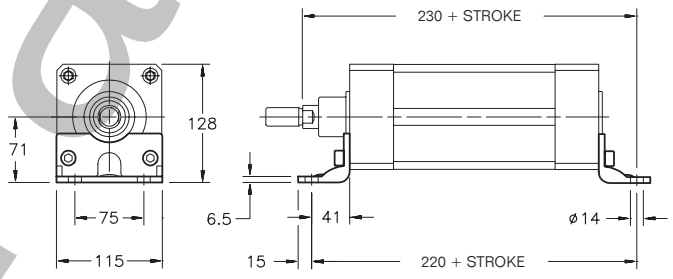
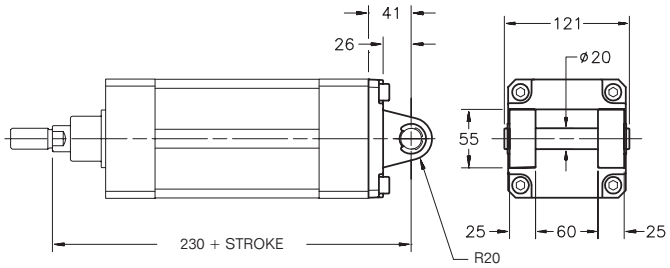
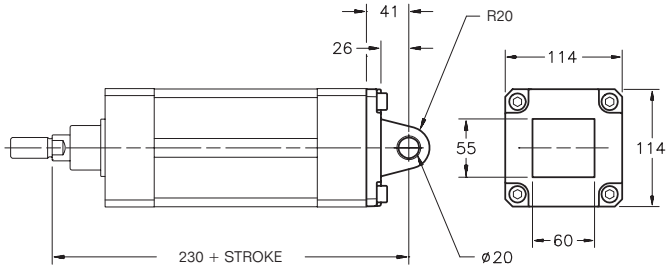
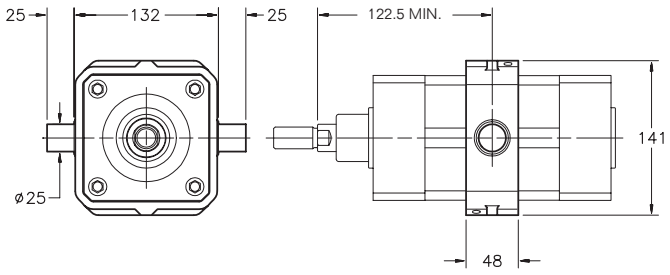


MN-5 - 0.030kg
ROD NUT



TB-100 - 0.163kg
TRUNNION MOUNTING BLOCK

ISO 6431, VDMA 24562 AIR CYLINDERS

MOUNTING KITS	DESCRIPTION	DIMENSIONS
MF-100 	**FRONT FLANGE MOUNTING KIT** *(ISO TYPE MF1)* Consists of: 1 Flange 4 Fixing Screws Weight: 2.500kg	
MF-100 	**REAR FLANGE MOUNTING KIT** *(ISO TYPE MF2)* Consists of: 1 Flange 4 Fixing Screws Weight: 2.500kg	
MS1-100 	**FOOT BRACKET MOUNTING KIT** Consists of: 2 Foot Brackets 4 Fixing Screws Weight: 1.085kg	
MP2-100 	**CLEVIS MOUNTING KIT** Consists of: 1 Clevis Bracket 4 Fixing Screws 1 Pivot Pin 2 Circlips Weight: 1.008kg	
MP4-100 	**PIVOT MOUNTING KIT** Consists of: 1 Pivot Bracket 4 Fixing Screws Weight: 0.690kg	
MT-100 	**TRUNNION MOUNTING KIT** Consists of: 1 Centre Trunnion 4 Set Screws Weight: 1.213kg	

POSITION FEEDBACK ISO 6431, VDMA 24562 AIR CYLINDERS

OVERVIEW

Continuous Position Sensing in an ISO 6431 VDMA Air Cylinder

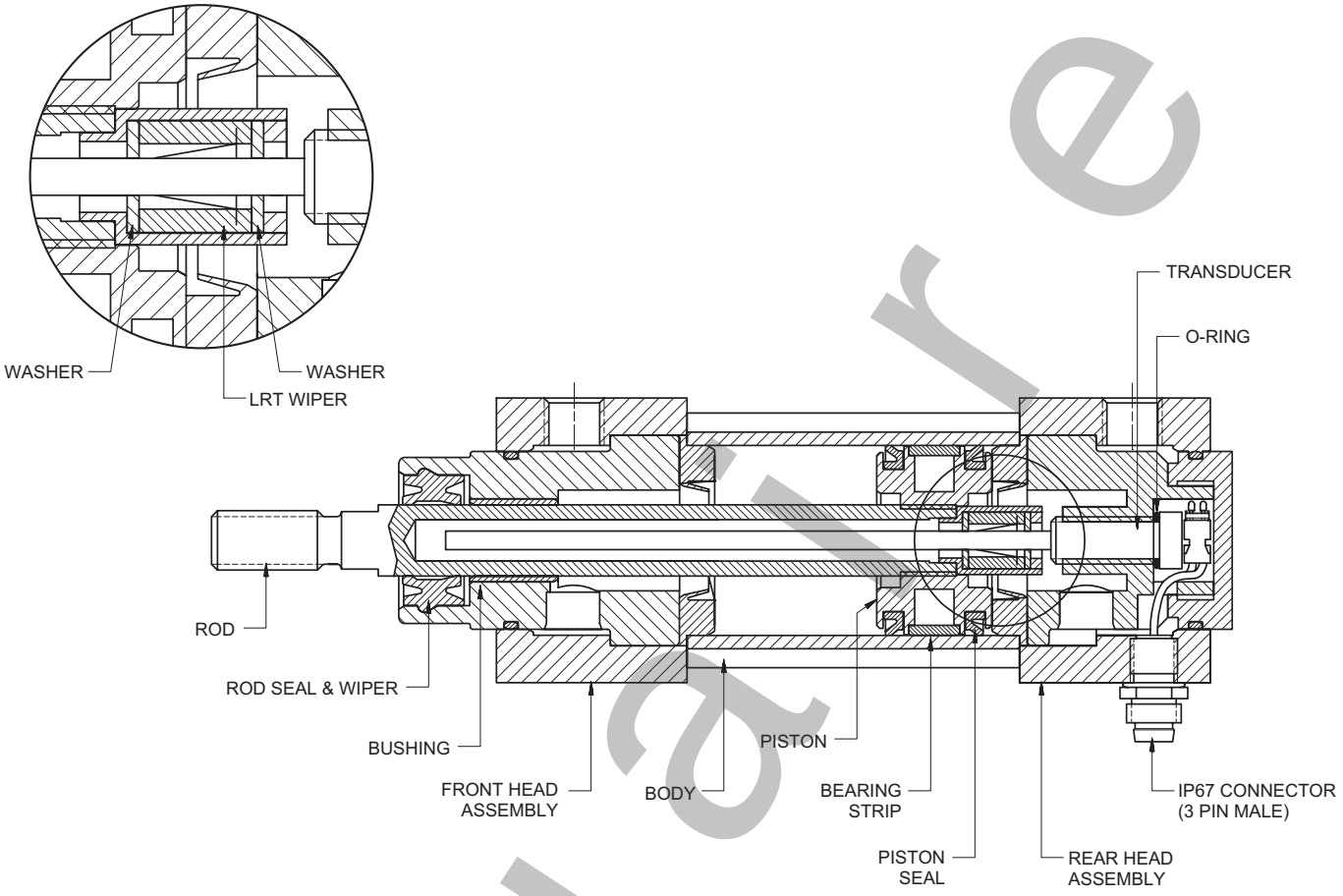
The Bimba Position Feedback Cylinder is Ideal for applications where an operation requires constant monitoring of cylinder position, where variations in cylinder speed or stroke are needed, or where a proportional output voltage is used to drive logic decisions.

- **Flexible**
  - Stroke lengths available up to 600mm.
- **Highly accurate**
  - Infinite resolution, linearity of ±1 percent of full stroke, ±0.025mm repeatability.
- **Electronic controllers available**
  - For dual set point and scalable analog output applications.
- **Interchangeable**
  - Dimensions according to ISO 6431/VDMA 24562.
- **Quick connect**
  - Sealed (IP67) cable connector standard.
- **Repairable**
- **Advanced bearing and seal materials for long cylinder life**
- **A variety of mounting kits available for use with each basic cylinder**

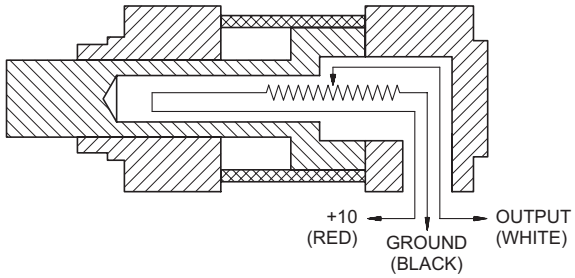
CYLINDER WEIGHTS (Kgs)						
Bore	**32**	**40**	**50**	**63**	**80**	**100**
PFA-_	0.590	0.862	1.370	2.003	3.348	4.779
Additional Weight (per mm stroke)	0.003	0.005	0.006	0.008	0.010	0.012

POSITION FEEDBACK ISO 6431, VDMA 24562 AIR CYLINDERS

HOW IT WORKS



The Bimba Position Feedback Cylinder contains a Linear Resistive Transducer (LRT) or potentiometer mounted in the cylinder rear head. The LRT probe, which has a resistive element on one side and a collector strip on the other, is inside the cylinder rod. A wiper assembly is installed in the piston. As the piston moves, an electrical circuit is created between the resistive element and collector strip. The resulting voltage is directed externally via wiring. The output voltage is proportional to the wiper position on the resistive element, which allows the cylinder position to be determined.



WHEN STROKE = 0: OUTPUT VOLTAGE = 0 VOLTS
WHEN STROKE = FULL: OUTPUT VOLTAGE = 10 VOLTS

LRT Diagram

For example, in a 300mm stroke cylinder, the output voltage would be 0 VDC when fully retracted and 10 VDC when fully extended. Voltage readings of 2.5 and 5.833 VDC would indicate cylinder extensions of 75mm and 175mm.

The accuracy of an LRT is determined by three factors: resolution, linearity and repeatability.

Resolution refers to the smallest change that can be detected on the LRT. The Bimba LRT has infinite resolution, and can be divided into as many parts as the electronics allow. For example, with a 12-bit, controller, the stroke could be divided into 4096 parts. With a 10 VDC input to a 250mm cylinder, the smallest detectable increment would be 10 VDC÷4096=2.4 millivolts or 250÷4096=0.06mm. Resolution is stroke sensitive, i.e., the longer the stroke, the less resolution.

Linearity refers to the maximum deviation of the output voltage to a straight line. The Bimba LRT's linearity is ±1 percent of stroke.

Repeatability is the ability of the LRT to provide the same output voltage relative to a unique cylinder position each time the cylinder is cycled. Repeatability of the Bimba Position Feedback Cylinder is ±0.025mm.

POSITION FEEDBACK ISO 6431, VDMA 24562 AIR CYLINDERS

ENGINEERING SPECIFICATIONS

Repeatability:	±0.025mm
Linearity:	±1 percent of full stroke
Resolution:	Infinite
Signal Input:	0 to 10 VDC
Signal Output:	0 to 10 VDC when used with a ***BIMBA*** controller (or PLC with signal conditioning). 1 Mohm impedance min. required
Maximum speed:	1000mm/s
Rated Life of Cylinder:	3000Km of travel
Rated Life of Probe:	12000Km of travel
Pressure Rating:	10 bar
Temperature Rating:	-18°C to +71°C
Connector:	IP67
Cylinder Body:	Anodised Aluminium Alloy
Piston Rod:	Stainless Steel
Rod Bearing:	Self Lubricating Thermoplastic Alloy
Heads:	Anodised Aluminium Alloy
Rod Seal /Rod Wiper:	Polyurethane (standard)
Piston Seal:	Polyurethane (standard)

HOW TO ORDER

The Model Number for all Bimba ISO 6431 Position Feedback Cylinders consists of four Alpha-Numeric clusters. The first cluster designates the *Type*, the second the *Bore Size*, the third the *Stroke Length*, and the fourth the *Options*.
The basic cylinder can be ordered by referring to the chart below, and the following example:

Model Number **PFA-32-100-NT**: This is an ISO 6431 Type Position Feedback Cylinder, with 32mm Bore Size, 100mm Stroke Size, and with no rod threads.

PFA-32-100-NT

TYPE	BORE SIZE	STROKE		OPTIONS
PFA	32mm	25mm	180mm	M = MAGNETIC PISTON
	40mm	50mm	200mm	NT = NO ROD THREADS
	50mm	80mm	250mm	EE = EXTRA ROD EXTENSION
	63mm	100mm	300mm	
	80mm	125mm	450mm	
	100mm	150mm	600mm	

Alternative seal materials are available depending on application requirements.

ORDER ONLINE

Model DPM - 1/8 DIN Universal DC Input Panel Meter

The BIMBA DPM may be used with the position feedback Cylinder. The Controller provides a digital LED readout that may be calibrated to indicate the position of the cylinder in desired units. The PFC/DPM combination is ideal for measuring and gauging applications. The controller includes the following features:

- *PFC Compatible Excitation and Input Impedance*
- *85-250 VAC 50/60 Hz , 15 VA*
- *16 Point Calibration Feature for Increased PFC Linearity*
- *Max. and min. Reading Memory*
- *5 Digit Display*
- *Programmable Function Keys*
- *Optional Serial Communication, Including RS-232, RS-485 and DeviceNet®*
- *Optional Analog Card with 16 bit Resolution*
- *NEMA 4X/IP65 Sealed Front Bezel*
- *CE Compliant*
- *Fast Input and Output Rates- Programmable*

GENERAL DESCRIPTION

The DPM embodies many features and performance capabilities to suit a wide range of indication requirements. The meter employs advanced technology for stable, drift free readout, while incorporating features that provide flexibility now and in the future with Plug-in option cards. The option cards afford the opportunity to easily configure the meter for the needs of the present while providing an upward migration path as control and indication needs evolve.

The DPM provides a precision excitation compatible for Bimba's PFC. 16-point input scaling feature improves PFC linearity if necessary. The meter provides a max. and min. reading memory with programmable capture time. The capture time is used to prevent detection of false max. and min. readings which may occur during start-up or unusual process events.

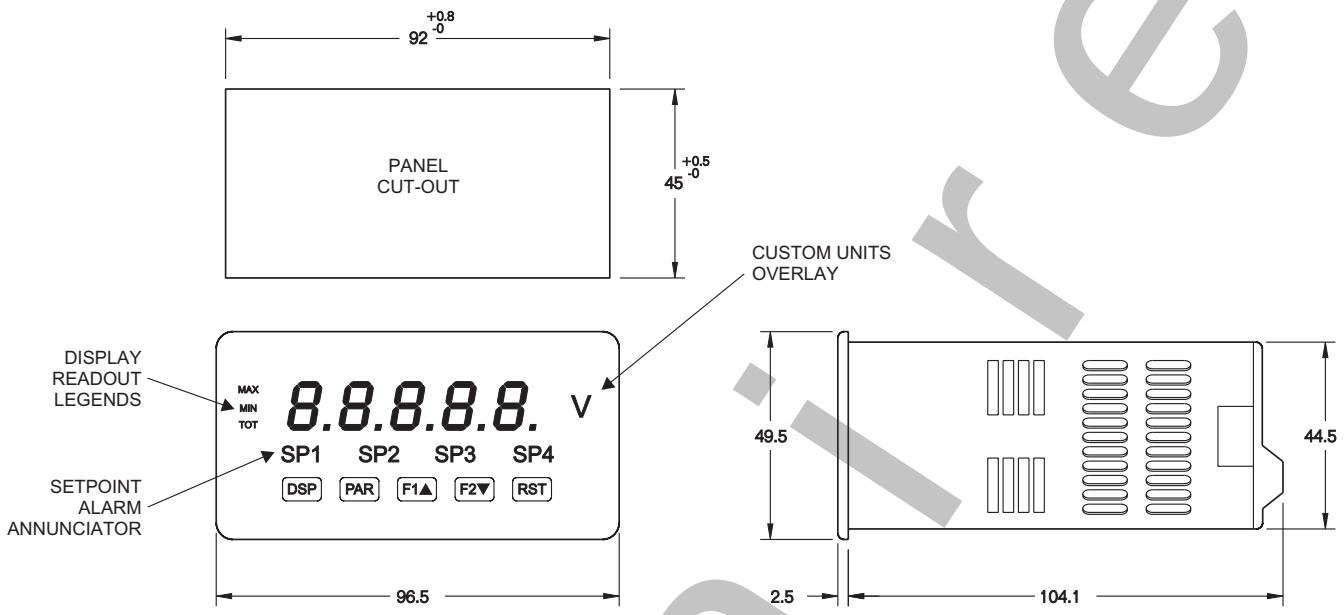
The signal totalizer (integrator) can be used to compute a time-input product. This can be used to provide a readout of totalized flow, calculate service intervals of motors and pumps, etc. The totalizer can also accumulate batch weighing operations.

The DPM comes standard with four sourcing setpoint outputs. The setpoint alarms can be configured in modes to suit a variety of control and alarm requirements.

Optional accessory cards also facilitate bus communications. These include RS-232, RS-485 and DeviceNet. Readout values and setpoint alarm values can be controlled through the bus. Additionally, the meter has features that allow a remote computer to directly control the outputs of the meter. This is useful during commissioning phases and diagnostic use. With a communication card installed, set-up software allows configuration from a PC. The configuration data can be saved to a file for later recall. Contact Bimba for information if required.

Once the meter has been initially configured, the parameter list may be locked out from further modification in its entirety or only the setpoint values can be made accessible. The meter has been specifically designed for harsh industrial environments. With NEMA4 X/IP65 sealed bezel and extensive testing of noise effects to CE requirements, the meter provides a tough and reliable local readout.

DIMENSIONS



Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 53.4mm x 140mm

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
DPM	Base Unit - Includes Excitation, Quad Solid State Outputs
DPMA	Base Unit with Analog Card
DPMS	Base Unit with RS-485 Serial output
DPM-485	RS-485 Plug-in Accessory Card
DPM-232	RS-232 Plug-in Accessory Card
DPM-DNET	DeviceNet Plug-in Accessory Card
DPM-A	Analog Plug-in Accessory Card
DPM-R	Quad Form A 120 VAC Relay Plug-in Accessory Card

SPECIFICATIONS

Shipping Weight (est.): 0.295kg
Power: 85-250VAC 50/60Hz , 15VA
Electronics Operating Range: 0°C to 50°C
(0°C to 45°C with all three plug-in cards)
Designed and tested to meet EMC Directive: 89/336/EEC

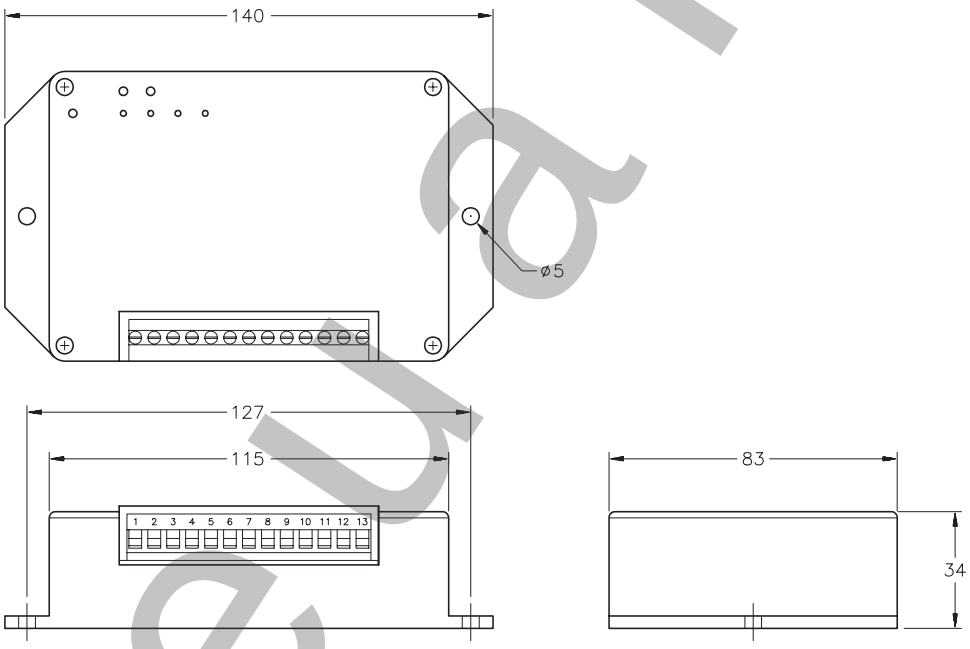
For more detailed user information refer to the catalogues for
DPM - 1/8 DIN Universal DC Input Panel Meter
& DPM - Optional Accessory Cards

BIMBA ELECTRONIC CONTROLLER

OVERVIEW

The Bimba Electronic Controller provides 10 VDC regulated power to the Position Feedback Cylinder. Four models are available for AC or DC input and output. Each controller offers both dual set point and scaled analog output functions.

MODEL	INPUT POWER	SCALEABLE OUTPUT
12/24DC4-20mA	12-24 VDC	4 - 20 mA
12/24DC0-10DC	12-24 VDC	0 - 10 VDC
120AC4-20mA	120 VAC	4 - 20 mA
120AC0-10DC	120 VAC	0 - 10 VDC



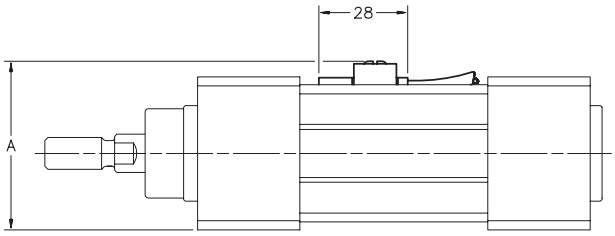
SPECIFICATIONS

Shipping Weight: 0.36Kg
Power input Requirements:
AC (AC models) 120V 60Hz .1 AMP
DC (DC models) 12-24VDC .1 AMP
Input Fuse: 0.25 AMP
Output Specifications — Set Point:
Relay (2) 2 AMP @ 28VDC
Output specification:
0 to 10V, 1 mA MAX. output current
(10 Kohm impedance MIN.)
4 to 20mA, into 500 ohm MAX. impedance
Max. zero offset: 50 percent of cylinder stroke
Min. span range: 50 percent of cylinder stroke
Electronics Operating Range:
4°C to 54°C

User manual provided with each controller

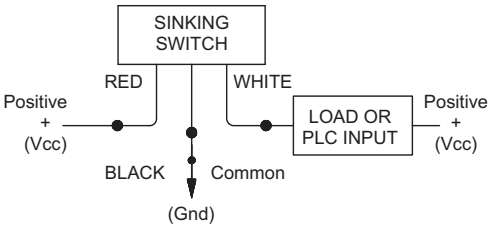
HALL EFFECT SWITCH

DIMENSIONS

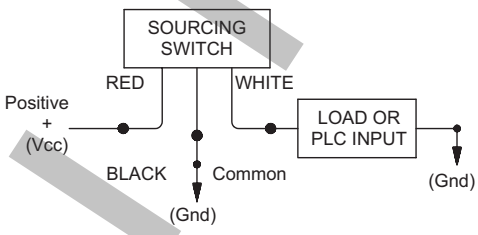


BORE	32	40	50	63	80	100
Dimension A (mm)	53	61	71	83	102	121

WIRING DIAGRAMS

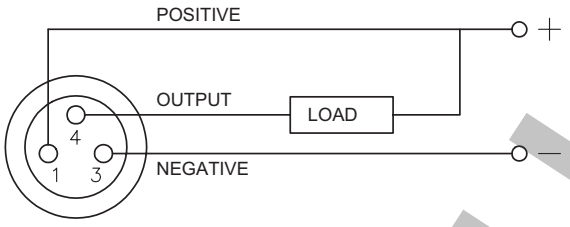


Typical Hall Effect Sinking Configuration (NPN)

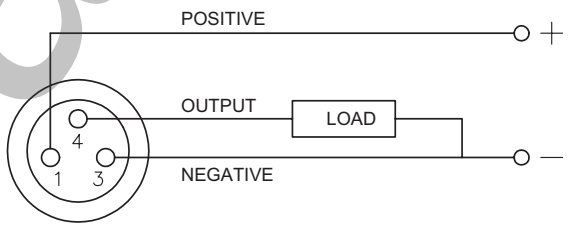


Typical Hall Effect Sourcing Configuration (PNP)

ELECTRICAL CIRCUIT DIAGRAMS - Male Connector

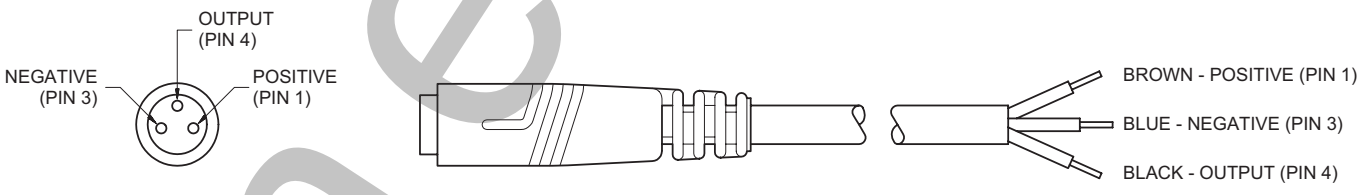


8mm Male Connector
Sinking Hall Effect Switch



8mm Male Connector
Sourcing Hall Effect Switch

PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT - Female Connector



8mm Female Connector

ELECTRICAL SPECIFICATIONS

Output Type: . . . . . Current sinking or sourcing
Input Voltage: . . . . . 5 to 30VDC
Input Current: . . . . . 25mA maximum
"ON" Voltage Drop:
Sinking: . . . . . 0.4 volts maximum
Sourcing: . . . . . 1.5 volts maximum
Output Current: . . . . . 300mA maximum
Power Dissipation: . . . . . 300mW maximum
Temperature Range: . . . . . -25°C to +70°C
Turn On Time: . . . . . 2 microsec.
Turn Off Time: . . . . . 1 microsec.
Off-State Leakage: . . . . . 20 x 10^{-9} A (20 nanoamps)
Signal Repeatability: . . . . . ±0.38mm
Reverse Polarity Protected
Over Voltage Protected

HOW TO ORDER

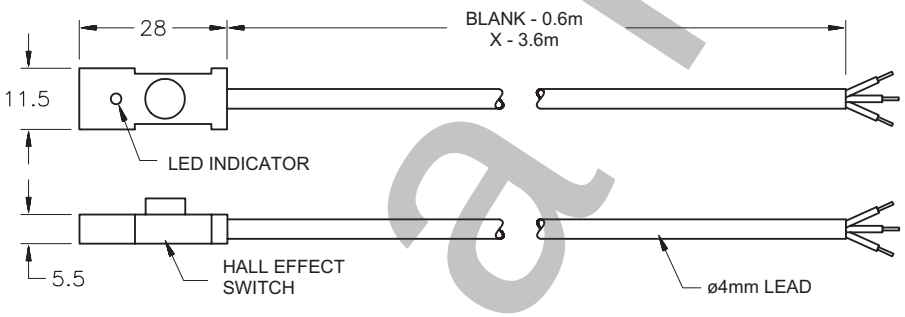
To order a Bimba HES switch mounting bracket, use the following identification code.

SWB-HES

BASIC CABLE TYPE

HSK X

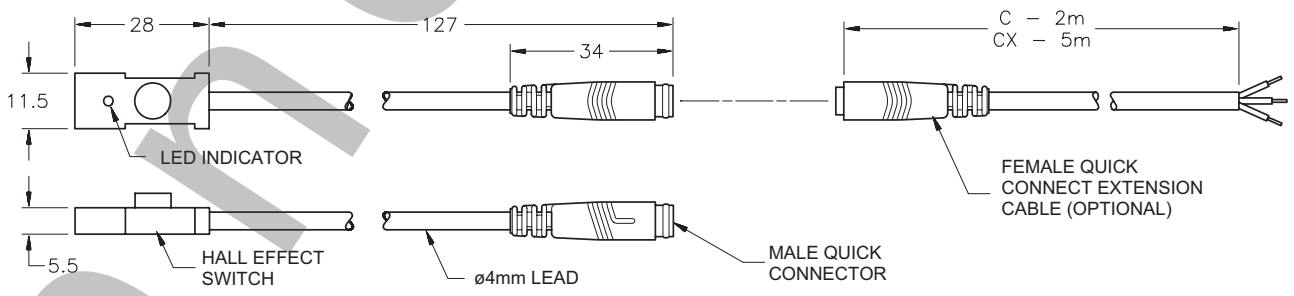
SWITCH TYPE	OPTION: CABLE LENGTH
HSC - Current Sourcing (PNP) HSK - Current Sinking (NPN)	Blank - 0.6m X - 3.6m



QUICK CONNECT CABLE TYPE

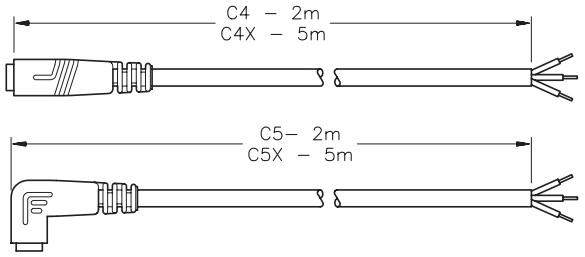
HSKQ C

SWITCH TYPE	OPTION: FEMALE EXTENSION CABLE
HSCQ - Current Sourcing (PNP) HSKQ - Current Sinking (NPN)	Blank - No additional female cable included C - 2m straight female cable CX - 5m straight female cable



CABLE CONNECTORS (Sold Separately)

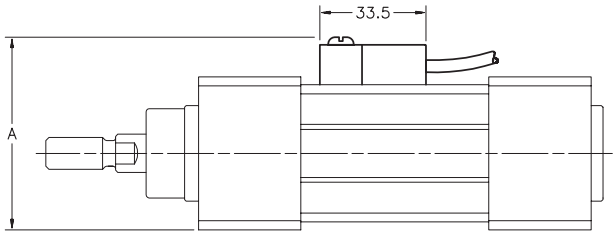
MODEL	DESCRIPTION
C4	2m Straight
C4X	5m Straight
C5	2m Right Angle
C5X	5m Right Angle



Straight and right angle cable connectors

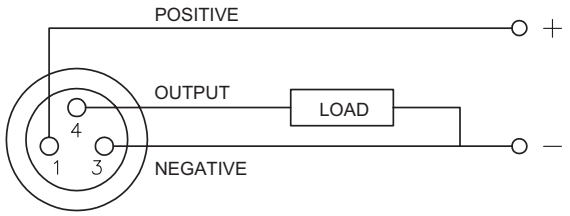
MAGNETIC REED SWITCH

DIMENSIONS

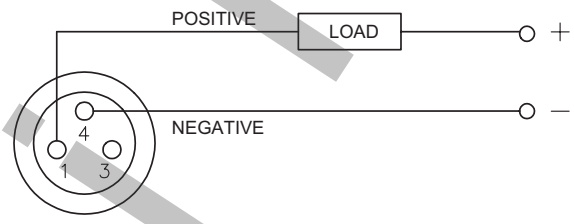


BORE	32	40	50	63	80	100
Dimension A (mm)	61	68	79	91	110	129

ELECTRICAL CIRCUIT DIAGRAMS - Male Connector

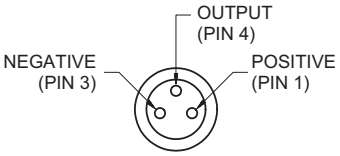


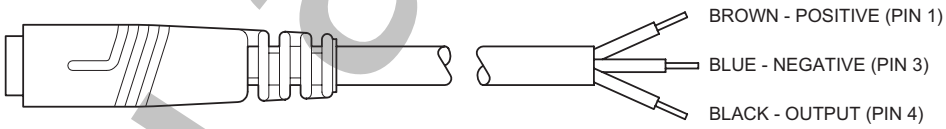
MRS-.087-BLQ
8mm Male Connect



MRS-.087-BQ and MRS-.087-PBLQ
8mm Male Connect

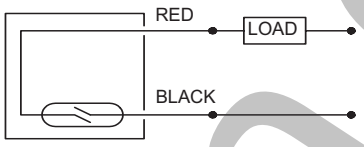
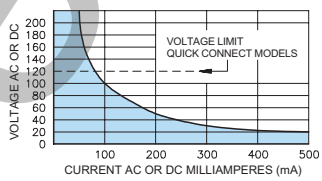
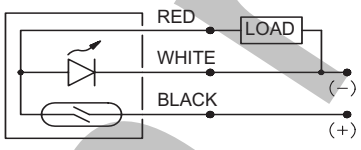
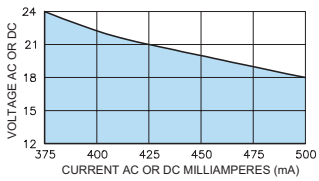
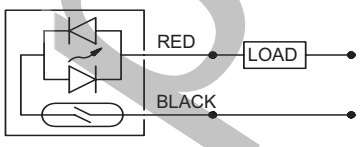
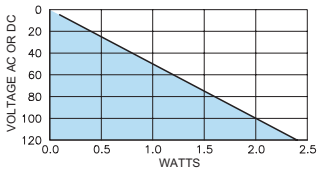
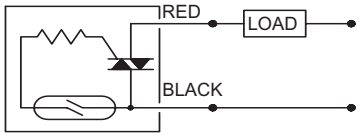
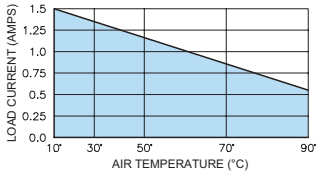
PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT - Female Connector





8mm Female Connector

ELECTRICAL SPECIFICATIONS

CIRCUIT DIAGRAMS	LOAD CURRENT DERATING CURVES (Shaded area indicates operating range)	ELECTRICAL SPECIFICATIONS
MRS-.087-B 		**Contacts** . . . . SPST Form A (Normally Open) **Contact Rating** . . . . . 10 Watts Max. **Switching Voltage** . . 200 Volts Max. AC or DC **Max. Current** . . . . . 500mA-Max. (Resistive) **Actuating Time Average** . . . . . 1.0 Millisecond
MRS-.087-BL 		**Contacts** . . . . SPST Form A (Normally Open) **Contact Rating** . . . . . 9 Watts Max. **Switching Voltage** . . . . . 6-24 Volts AC or DC **Max. Current** . . . . . 500mA-Max. (Resistive) **Actuating Time Average** . . . . . 1.0 Millisecond
MRS-.087-PBL 		**Contacts** . . . . SPST Form A (Normally Open) **Contact Rating** . . . . . 2.5 Watts Max. **Switching Voltage** . . . 3 to 120 Volts AC or DC **Min. Current** . . . . . 10mA **Current Rating** . . . . . .10 to 20 mA (Resistive) **Actuating Time Average** . . . . . 1.0 Millisecond
MRS-1.5-B 		**Contacts** . . . . SPST Form A (Normally Open) **Voltage Rating** . . . . . 12V-230V (AC Only) **Min. Current** . . . . . 0.1 Amps. **Max. Current** . . 1.5 Amps (See Derating Curve) **Actuating Time Average** . . . . 2.0 Milliseconds

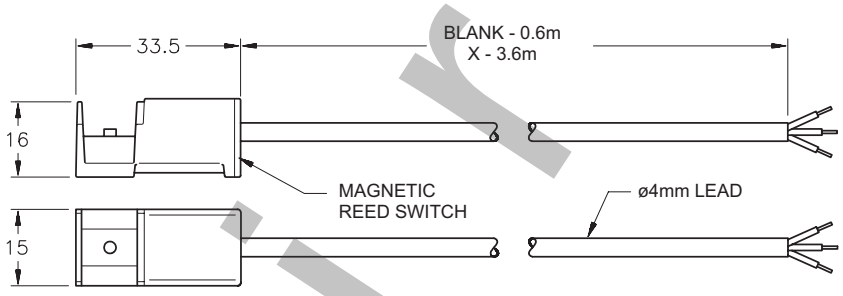
HOW TO ORDER

To order a Bimba MRS switch mounting bracket, use the following identification code.

SWB-MRS

BASIC CABLE TYPE

SWITCH TYPE
MRS-.087-B
MRS-.087-XB
MRS-.087-BL
MRS-.087-XBL
MRS-.087-PBL
MRS-.087-PXBL
MRS-1.5-B
MRS-1.5-XB



LED INDICATOR - An 'L' in the model number signifies the presence of an LED indicator.

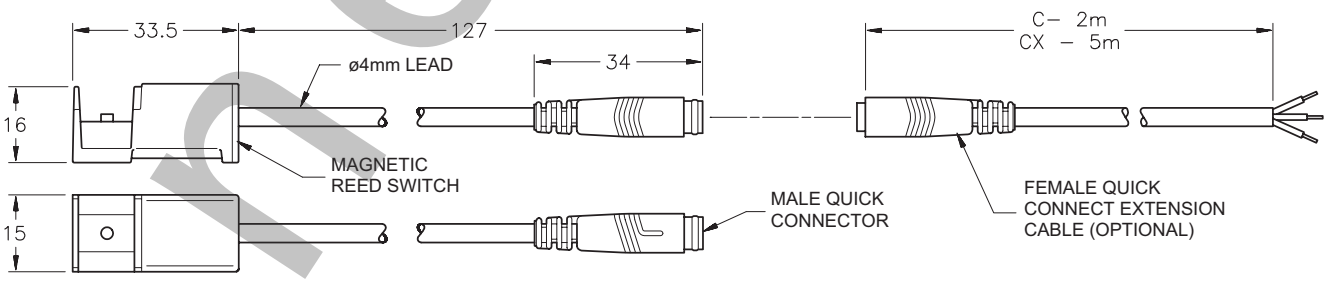
CABLE LENGTH -The standard cable length is 0.6m. Switches with an 'X' in the model number indicate a cable length of 3.6m.

QUICK CONNECT CABLE TYPE

MRS-.087-BQ CX

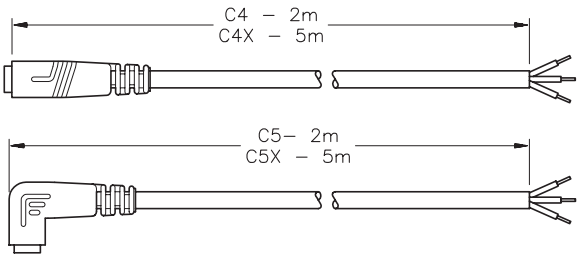
SWITCH TYPE
MRS-.087-BQ
MRS-.087-BLQ
MRS-.087-PBLQ

OPTION: FEMALE EXTENSION CABLE	
Blank	- No additional female cable included
C	- 2m straight female cable
CX	- 5m straight female cable



CABLE CONNECTORS (Sold Separately)

MODEL	DESCRIPTION
C4	2m Straight
C4X	5m Straight
C5	2m Right Angle
C5X	5m Right Angle



Straight and right angle cable connectors

REPAIR KIT

HOW TO ORDER REPAIR PARTS AND KITS

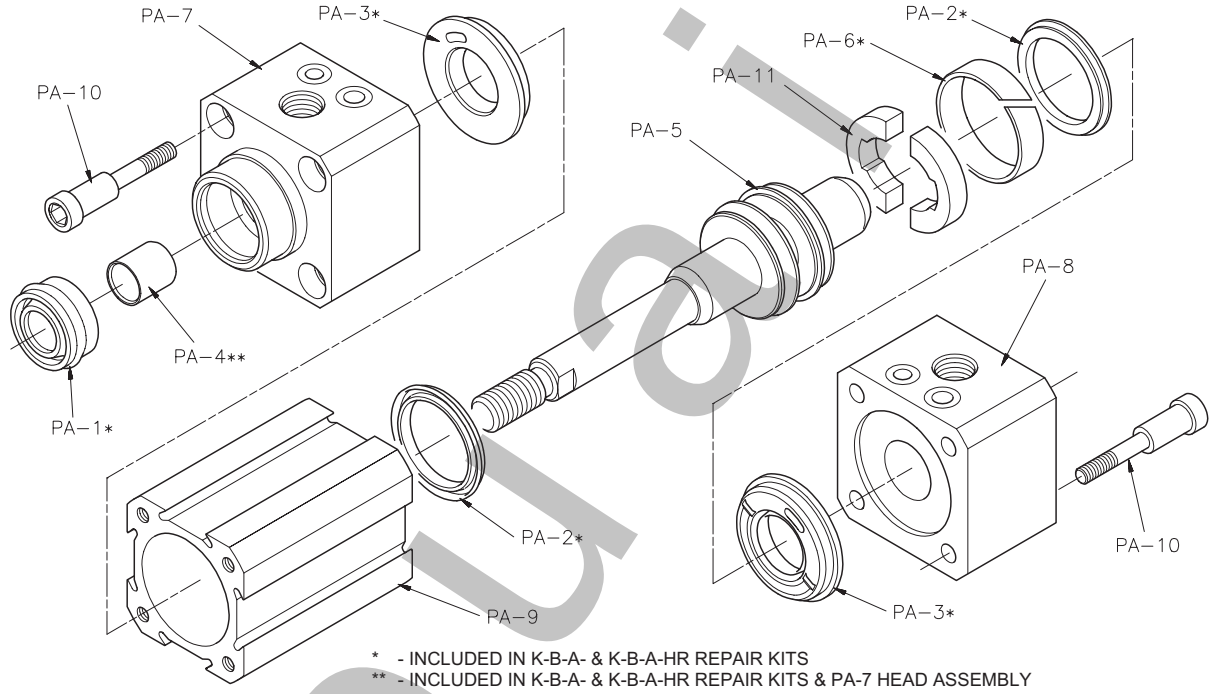
When ordering Individual Repair Parts and Kits indicate the quantity desired, the part number or kit designation, and the cylinder model number on which the part is to be used.

For example a Piston Seal for an ISO 6431 Type Cylinder, with 32mm Bore Size, 100mm Stroke Size, and with Cushions in Both Heads and Flow Controls in Both Heads, would be ordered as follows:

QUANTITY	PART OR KIT NUMBER	MODEL NUMBER
1	PA-2	A-32-100-CBFB

A Basic Repair Kit for the same cylinder would be:

1	K-B-A	A-32-100-CBFB



* - INCLUDED IN K-B-A- & K-B-A-HR REPAIR KITS
** - INCLUDED IN K-B-A- & K-B-A-HR REPAIR KITS & PA-7 HEAD ASSEMBLY

REPAIR PARTS

PART No.	DESCRIPTION	PART No.	DESCRIPTION	PART No.	DESCRIPTION
PA-1	Rod Seal/Wiper Kit (Includes retaining ring in HR model)	PA-5	Piston Rod Assembly	PA-10	Assembly Bolt
		PA-6	Piston Bearing Ring	PA-11	Magnet
PA-2	Piston Seal	PA-7	Front Head Assembly	PA-12	LRT Probe
PA-3	Cushion Seal/Bumper	PA-8	Rear Head Assembly	PA-13	Connector
PA-4	Rod Bearing	PA-9	Body		

REPAIR KITS

PART No.	DESCRIPTION	INCLUDES			
K-B-A	Basic Repair Kit	Rod Seal/Rod Wiper Piston Seal Cushion Seal/Bumper	PA-1 (1) PA-2 (2) PA-3 (2)	Rod Bearing Piston Bearing Ring	PA-4 (1) PA-6 (1)
K-B-A-HR	Basic Repair Kit High Temperature Option (HR)	Rod Seal/Rod Wiper Rod Seal/Rod Wiper Retaining Ring Piston Seal	PA-1 (1) PA-1R (1) PA-2 (2)	Cushion Seal/Bumper Rod Bearing Piston Bearing Ring	PA-3 (2) PA-4 (1) PA-6 (1)
For double ended cylinders add -D option to the repair kit part number					